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Children's Affective Expression in Human Figure Drawings: Adult Recognition of Children's Depiction of Six Affective Expressions.

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CHILDREN'S AFFECTIVE EXPRESSION IN HUMAN FIGURE DRAWINGS: ADULT RECOGNITION OF CHILDREN'S DEPICTION OF SIX AFFECTIVE EXPRESSIONS

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ABSTRACT

The understanding of children's abilities to express affect in drawings of the human figure has clinical and developmental significance, yet is an area that until recently has received relatively minimal research attention. The present study investigated the abilities of child psychologists, graduate psychology students, and non-mental health raters to correctly identify the attempts of 72 kindergarten, second, fourth, sixth, eighth, and tenth-grade students to depict six common affective expressions in human figure drawings. The affective expressions were: happiness, sadness, anger, disgust, surprise, and fear. Thirty-six adult raters (18 female; 18 male) reviewed 216 drawings, identified the perceived affective expression, and rated their confidence in their selections. The effects of child sex, adult sex, affective expression, and rater group assignment on rater accuracy were analyzed. The results clearly indicated significant differences in recognition rates for the six affective expressions with Sadness and Happiness correctly recognized most frequently (≃80%), followed by Anger and Disgust (≃60%) and Surprise and Fear (≃35%); the overall recognition rate was 58%. Accuracy of recognition was considerably lower (i.e., 41%, overall) when rater commission errors were considered. Significant increases in adult recognition rates directly coincided with increases in child age; however, these differences were not consistent across

affective conditions. Recognition rates were not affected by the sex of the adult rater. Graduate psychology students obtained the highest mean accuracy rate (61%), followed by child psychologists (58%) and non-mental health raters (55%); the significant differences between rater groups were attributed to individual rather than actual group differences. Raters apparently recognized their limitations on this task as indicated by significantly lower confidence ratings for incorrectly identified than correctly identified drawings. Higher accuracy ratings were associated with lower confidence ratings and vice versa, suggesting that accuracy and perception of accuracy were inversely related. Caution was encouraged when making clinical inferences from the data because of the seminal nature of the study. It was concluded that the adult recognition rates were too low to be clinically reliable, despite being well-above chance expectations. It was suggested that drawings may have a place in clinical child assessments if important precautions are considered. Recommendations for further research were given.

Introduction

The investigation of children's and adult's drawings has a long history in psychology. In fact, interest in drawings preceded the recognition of psychology as a distinct scientific field. In psychology, two lines of research have developed in the area of children's drawings, with dissimilar objectives differentiating the clinical child and developmental literatures. The clinical child literature has emphasized children's drawings as data for clinical assessments, while the developmental literature has addressed more general issues related to the emergence and significance of drawing skills among children. The disparity of goals and objectives, and the lack of intradisciplinary communication of research findings has interfered with an integration of acquired information. The following review seeks to identify these differences and similarities in the clinical child and devlopmental literatures with specific implications for the expression of affect in children's drawings.

The history of children's drawings has been well-documented elsewhere (e.g., Goodenough, 1926; Anastasi & Foley, 1940; Goodenough & Harris, 1950; Burns, 1982), and therefore, will only be briefly reviewed here. The systematic analysis of children's drawings can be traced to early interest in individual differences, primarily among clinical populations, but also with school populations. The earli-

est reported interests in drawings among psychiatric populations were case studies of institutionalized patients. For example, Haslam in 1810 (cited in Anastasi & Foley, 1940) described a series of drawings made over a period of several years by a patient in Bethlehem Hospital who hallucinated and was actively delusional. In the latter part of the 19th century, interest was directed towards differences between "normal" and "insane" art. The interest culminated in a series of art exhibitions in several European cities during the latter part of the 19th century and the early decades of the 20th century which received considerable attention from mental health professionals, artists, and the lay public (Anastasi & Foley, 1940; Schildkrout, Shenker, & Sonnen-Glick, 1972). The interest at the time was not in differences due to pathological condition, but whether "insanity" was a state of advanced creativity.

Although interest in children's drawings has a long historical tradition, Goodenough's work (1926) traces modern interest to 1885 when Ebenezer Cooke, a school art teacher described individual differences in the drawings of school age children. In the final years of the century, published accounts of children's drawings by investigators from several European countries described performance differences between school age children in art classes and were intended as means to improve art education. In the early decades of the 20th century, two major research stud-

ies were initiated to collect samples of children's drawings from various cultural groups in the world under standard testing conditions (Lamprecht, 1905; Claparede, 1907, cited in Goodenough, 1926). These studies attempted to determine racial differences in drawing products and the correlation between drawing ability and intellectual level. Although neither study was sufficiently completed to produce meaningful results, they provided useful models for future research on drawings.

Drawings for intellectual and personality assessment:

In addition to the influence of these projects, Goodenough particularly noted the influence of Schuyten and Lobsien (cited in Goodenough, 1926) in her later development of a method for assessing intellectual level based upon human figure drawings. These investigators had attempted to establish age norms for children in their abilities to draw human figures, and as Goodenough would do later, Schuyten and Lobsien focused on the specific details of the drawing such as body parts, body proportion, and so forth, in determining test scores. The introduction of Goodenough's human figure drawing technique for intellectual assessment was a significant impetus for the continued and expanded study of children's drawings, particularly in the United States. Prior to that time, much of the research on drawings had been conducted in Europe. Goodenough incorporated the developmental observations made by

her predecessors into a workable and relatively reliable instrument for grossly estimating a child's intellectual functioning. Derivations in IQ scores were based upon developmentally observed expectations for body articulation in human figure drawings. The Goodenough Draw-a-Man test (DAM) was quickly accepted as a useful tool by child clinicians.

Interest in children's drawings as indicators of personality functioning was also increasing among psychologists. This line of inquiry culminated in the works of Buck (1948) with the House-Tree-Person Test, Machover (1949) with the Draw-a-Person Test (DAP), and Koppitz (1969) with the DAP as applied to children. Unlike Goodenough's DAM test which was derived from normative data, the origins of the personality drawing tests such as those by Buck, Machover, and Koppitz were primarily based upon the application of psychoanalytic theory to the understanding of personality dynamics as indicated through drawings, although developmental considerations did receive attention from Koppitz. In fact, the use of normative data to validate DAP techniques received relatively minimal attention as compared with the development of the DAM. The distinction between the origins of the DAP and DAM techniques is noteworthy because of implications for the current applications and understanding of drawing procedures for child assessments. The major criticisms of the reliability

and validity of the DAP and DAM tests will soon be discussed.

Following the initial efforts of Goodenough (1926), Buck (1948), and Machover (1949), refinements and extensions of both intellectual and personality drawings techniques have been offered. Koppitz (1969) developed a downward extension of the HFD to child populations, Harris (1963) redesigned the Goodenough IQ test, and many additional projective personality techniques have been introduced. One of these techniques, the widely used Kinetic Family Drawing Test (KFD), requires the child to draw a picture of all family members engaged in a common activity, and is thought by its developers to provide evidence about family dynamics unavailable from the standard HFD test (Burns & Kaufman, 1970, 1972).

The KFD is but one of several drawing techniques developed for assessment purposes. The diversity and interrest drawing techniques have had within clinical psychology are indicated by the following partial list of drawing procedures: Franck Incomplete Drawing Test (Franck & Rosen, 1949), Draw-a-Family Test (Hulse, 1951), Tree Test (Koch, 1952, cited in Bolander, 1977; Bolander, 1977), Draw-a-Group Test (Ferin, 1954), Draw-a-Member of a Minority Test (Hammer, 1958), Draw-a-Person in the Rain Test (Amchin & Abrams, 1976), Draw-a-Person Test of Ego Stage Development (Entin, 1976), Drawing Completion Test (Kinget, 1952;

Davidson & Greenberg, 1976; Schulman, 1976), Draw-a-Picture of Your Classroom Test (Rogers & Wright, 1971), and Draw-a-Crazy Tree Test (Widrig, cited in Bolander, 1977).

As would be anticipated from the diversity of drawing techniques available for clinical use with children, the use of drawings in child assessments has had a major impact among clinical psychologists. Surveys of the clinical use of psychological tests have consistently indicated that drawings are considered to be an important tool for personality and/or intellectual assessment. In the first of these surveys, Louttit and Browne (1947) reported that the Goodenough DAM test was the third most popular assessment device in clinical use. (It should be noted that this survey preceded the development of the DAP techniques). Sundberg (1961) reported that the DAP was the second most frequently used test while the DAM was ranked tenth by practicing clinical psychologists. Lubin, Wallis, and Paine (1971) reported that the DAP, and specifically Machover's technique, was the fifth and the House-Tree-Person Test the tenth most frequently used test among clinicians. Brown and McGuire (1976) reported that the DAM, HTP, and DAP were ranked eighth, ninth, and tenth, respectively, among the most frequently used tests by clinical psychologists working in community mental health centers. These authors also reported that among 3-14 year old clients, the DAM and DAP tests were in the top five for frequency of use with the

DAP ranked as first or second for these age groups. Wade and Baker (1977) combined the HTP, DAM, and DAP tests into the single category of "picture drawings" and reported that practicing clinicians considered "picture drawings" to be the seventh most important testing technique that should be taught to clinical trainees. In the most recent survey of the use of assessment techniques among clinical child psychologists, Tuma and Pratt (1982) reported that drawing techniques were used in clinical assessments by 60% of their survey respondents, making drawing tests second in popularity only to the WISC-R as an assessment procedure. In summary, the results of these surveys indicate that the use of drawings in clinical child assessment is well-established in psychology, suggesting that these are respected assessment devices. Hammer (1981, p. 151), a recognized authority in the area of projective drawings, noted that "since their birth almost two decades ago, projective drawings as a clinical tool have moved relatively rapidly into a secure niche in the projective battery". Furthermore, since many experienced clinicians believe that drawing assessment techniques should be taught to clinical trainees, it may be assumed that many practicing clinicians are convinced that drawing tests effectively tap personality and intellectual functioning.

Additional evidence for the popularity of drawing tests in clinical psychology may be found in the amount of

research generated in the area. During the 20 year period between 1963-1982, over 500 clinical drawing articles appeared in Psychological Abstracts and 44 psychology doctoral dissertations appeared in Dissertation Abstracts International. Thus, there is considerable interest in children's and adult's drawings among psychologists as areas for research and applied use.

Rationales for traditional drawing assessments

A brief review of the suppositions behind clinical drawing procedures will provide an understanding of the clinical rationale for drawing tests, and will preface some of the specific criticisms of drawing techniques as currently applied within psychology. It was previously noted that interpretive guidelines for understanding children's drawings have been derived from psychoanalytic/psychodynamic conceptualizations of personality functioning. This perspective assumes that the child or adult presents him/herself in some interpretable manner in the drawings. The conflicts, urges, and needs of the person are projected into the drawing product. In essence, the drawing becomes "a self-projection invested of all one's psychic values and problems" (Karp, Morganstern, & Michal-Smith, 1978; p. 731). It is the clinician's task to decipher the meanings of these idiosyncratic representations. Thus, the content of the drawing, the manner in which it is produced, and the subject matter of the drawing, among other variables, are

considered in the interpretive analysis. Following from this line of reasoning, the theme of the drawing is often determined by the clinician, since it is assumed that certain objects or people have special meanings for the psychological functioning of the chil. For example, the traditional person drawing (DAP) measures the "environmental self" (Burns, 1982); that is, how the child sees him/herself in relation to the world as a whole. Furthermore, it is assumed that that "children tend to draw the kind of individual they most admire or respect" (Klepsch & Logie, 1982; p. 12). The KFD is believed to be an expression of the "molecular self" (Burns, 1982); that is, the self formed within the family life. The tree drawing is believed to represent the child's life history and is an "unconscious expression of the biographical events", events which include the child's relationship with his/her parents, important sexual experiences, traumatic incidents, and "hidden or repressed material" (DiLeo, in Bollander, 1977; pp. 1, 4). Thus, drawing tests are believed by some to be very powerful assessment tools.

The specific details of a drawing are considered to be important when interpreting the drawing product. It is assumed that the objects included in a drawing often have more than one level of meaning; that is, they have a literal and symbolic interpretation. For example, buttons on clothing may symbolically represent unfulfilled dependency

needs, or emphasis on the ears of the human figure may suggest heightened sensitivity to criticism. Furthermore, the style in which the drawing is made and the placement of objects on the paper are considered to be significant indicators of personality functioning (Ogdon, 1979).

In summary, a thorough and traditional drawing analysis takes into account the structure, content, and themes of the drawing and is largely based upon inferences concerning the clinical significance of these various aspects of the drawing. It is to Machover's credit, and to the credit of other DAP developers, that the specificity involved in the drawing analyses allows for direct assessment of the interpretive guidelines proposed by the authors. The large number of drawing research articles indicates that many of these suppositions have been empirically investigated.

Criticisms of traditional drawing techniques:

Despite their prevalent use by child clinicians, the use of children's drawing techniques for intellectual and personality assessment have been strongly criticized for a failure to demonstrate adequate psychometric reliability and validity. Since these data have been extensively reviewed elsewhere (e.g., Swensen, 1957, 1968; Roback, 1968; Scott, 1981), only the major conclusions of these reviews will be cited. In an early review, Swensen (1957) concluded that the accumulated research on figure drawings

(adult and child) provided little support for their justification as either measures of personality or intellectual functioning. However, he noted that the generally faulty experimental designs of many of these studies precluded conclusive decisions regarding the clinical value of drawing tests. Therefore, Swensen recommended that investigators carefully consider methodological issues when planning experimental designs. In his follow-up review, Swensen (1969) concluded that the quality of the research had improved but support for the use of the DAP and DAM was no more evident than previously. Roback (1969) concurred with Swensen's conclusions and further asserted that the data did not support the assumptions made by the developers of the tests. Roback criticized the Machover (1949) technique of projective assessment as unsubstantiated and frequently inaccurate in its predictions. Swensen and Roback suggested that future DAP should focus on global impressions of drawings rather than interpretations based upon details and pathological signs. They concluded that global ratings for personality assessment may be more reliable than ratings based upon specific content such as body parts or structural factors (e.g., figure placement, shading, etc.).

Scott (1981) reviewed the literature on the Goodenough-Harris Drawing Test (GHDT) and concluded that the evidence failed to support its use for intellectual assessments with children. Moreover, Scott concluded that the

use of the GHDT for screening intellectual level was unwarranted, since the test tended to underestimate intellectual level for average and above average children.

The accumulated clinical drawing research since the reviews of Swensen (1957, 1968), Roback (1968), and Scott (1981) provides no reason to disagree with the conclusions drawn by those investigators regarding the validity of the DAM and DAP tests. Nevertheless, drawing research has continued along similar lines to those cited in their reviews. The clinical research on children's drawings has typically employed contrasting groups to compare differences between drawing styles. Often these groups include a specific, although frequently inadequately defined, clinical group and a "normal" contrast group. As examples of this research, comparative analyses have been reoorted for aggressive versus non-aggressive children (Lefkowitz, 1964; Lingren, 1971; Handler, 1971); impulsive versus reflective children (Brannigan, Margolis, & Moran, 1979); emotionally-disturbed versus non-disturbed children (Nichols & Strumpfer, 1962; Fuller, Preuss, & Hawkins, 1970; Levenberg, 1975; McPhee & Wegner, 1976); low self-esteem versus adequate self-esteem children (Coopersmith, Sakai, Beardslee, & Coopersmith, 1976; Dalby & Vale, 1977; Prytula, Phelos, Morrisey, & Davis, 1978; Calhoun, Whitley, & Ansolabehere, 1978); deaf versus normal hearing children (Davis & Hoopes, 1975); obese versus average weight children (Nathan, 1973); neur-

ologically impaired versus non-impaired children (Denson & May, 1978); children with and without school adjustment problems (Vane & Eisen, 1962); and delinquent versus non-delinquent adolescent males (Burns, 1982). The variety of studies reviewed is illustrative of the believed applications of the DAP technique to clinical populations. The results of these studies have been mixed, with some investigators reporting that drawing tests effectively discriminated between groups while other investigators reported no differences between grouos. However, when the experimental designs are carefully considered, the better controlled studies (e.g., Denson & May, 1978; Prytula et al., 1978; Brannigan et al., 1979) fail to provide convincing support for the use of the DAP in personality assessment. Wanderer (1969) observed that many of the studies reporting results supporting DAP use failed to include experimenter-blind procedures, and therefore, the clinicians interpreting the results may have been biased. Specifically, the clinicians interpreting the drawings were frequently aware of other pertinent clinical information concerning the children, such as diagnostic classifications, that may have subtlely biased the interpretations.

Responses to the criticisms:

As described above, the emoirical evidence has generally argued against the traditional use of drawings in clinical assessment, and particularly with personality as-

sessments. However, despite the seemingly substantial evidence, many clinicians continue to rely on drawing techniques in child assessments. A variety of explanations have been offered to justify the continued use of drawing techniques, with interactions occuring between these explanations. One reasonable explanation may be that the clinicians who use drawing tests were taught the techniques while in graduate clinical training, and, therefore came to rely on the technique as an unquestioned component of their testing armamentarium. If this is a viable explanation, then the future use of drawings as traditionally employed may be limited. Swan and McDonald (1978) surveyed graduate clinical psychology training programs to determine the tests emphasized in graduate training. The results of their survey indicated that the majority of the responding programs no longer provide instruction in drawing assessment, or, if provided, give it only cursory attention.

Wanderer (1969) offered another explanation for the sustained popularity of the DAP technique among clinicians. He suggested that clinicians using drawing tests are on an intermittent reinforcement schedule so that test use behavior is quite resistant to extinction. Wanderer suggested that a clinician will occasionally make a "hit" with a particular drawing and thereby re-establish confidence in the validity of the instrument irrespective of emoirical data to the contrary.

Drawing tests are also valued because of their ease of administration and appeal to children. As Hammer (1981) pointed out, drawing tests require only a few minutes of the client's time (which is particularly important with children), they are easy to administer, and they offer a "rich clinical yield" (p. 150). Many clinicians use drawing tests to "warm up", i.e., acquaint, the child to the testing or interview session, and thereby reduce anxiety. Consequently, the test data are not as highly valued as is the process (Schildkrout, et al., 1972). Drawings are considered to be particularly valuable with children because of their difficulty or unwillingness to communicate concerns through written or verbal means (Apfeldorf, Walter, Kaimen, Smith, & Arnett, 1974; Hulse, 1951). In other words, drawings are assumed to be a medium of communication that is intrinsically appealing to children (Murstein, 1965). These arguments defending the use of drawings essentially cite the benefits of the drawing process, rather than the clinical content data provided by the drawings. Thus, it could be suggested that any technique which increases the child's interest in the testing/interview process would be as equally effective and useful as are drawing techniques.

Some clinicians, however, believe that the DAP test is more than a rapport-building device and assert that the DAP can be an empirically validated test of personality func-

tioning. These investigators contend that the wrong questions have been asked in the research. Instead of performing analyses on the DAP as a clinical test, the more appropriate measure would be to assess the clinicians using the DAP test. From this perspective, use of the DAP is conceptualized as a clinical skill or technique and not a clinical test. The distinction is made between a test which requires standard administrative and scoring procedures and a technique which is considerably more flexible in its applications and does not tend to be, or perhaps cannot be, standardized. Thus, from this perspective the DAP is considered only to be an additional means for obtaining data on a client.

In spite of the methodological problems posed, formal analyses have been conducted on the abilities of experienced clinicians to effectively differentiate drawings made by "normal" and "emotionally disturbed" persons. The results of these investigations have generally provided additional evidence that projective drawing techniques lack adequate discriminative ability. In these studies, comparisons are made between experienced and inexperienced drawing analysts in their abilities to make accurate diagnostic decisions solely from the drawing data. Schaeffer (1964) compared the results of clinical psychologists, clinical psychology trainees, and non-psychologists when making dichotomous diagnostic judgements, that is normal versus

emotionally disturbed, and found that these groups did not differ in the frequency of recogntion of drawings made by emotionally disturbed persons. Rogers and Wright (1971) asked clinical psychologists working in schools to determine whether drawings were made by emotionally disturbed or non-disturbed children. The psychologists were correct in only 56% of their decisions, which is only slightly above chance expectations. Striker (1967) found that graduate level clinical students better discriminated between drawings made by psychiatric and non-psychiatric populations than did experienced clinical psychologists. Levenberg (1975) compared secretaries, clinical psychologists, and pre-doctoral interns on a similar task, and also reported non-significant differences between groups. However, the majority of raters in the Levenberg study obtained greater than 50% accuracy on the task, with some reporting as high as 78% correct choices.

The results of these studies generally indicate that clinicians experienced in the use of children's projective drawing techniques are no more accurate than untrained raters when identifying pathology from drawing data. This evidence suggests that the psychologist's level of experience and training are not critical variables affecting the reliable use of the drawing tests. It should be noted that, despite these data, some proponents of drawing techniques discount the conclusions. One criticism made of

these studies has been a failure to account for the characteristics of the experienced clinicians, other than that they are experienced. Hammer (1981), for example, suggested that "artistic and sensitive" psychologists can use the HFD more effectively than "cognitive, sign-oriented" psychologists. These studies have also been criticized for the manner in which subjects are assigned to groups. It has been suggested that the "normal" children in the contrast control groups may not have been free from pathology, and therefore were not representative comparisons (Hiler & Nesvig, 1965).

A final response to the criticisms of drawing tests for personality assessment deserves attention, because it represents a rejection of scientific thought and is a view shared by some experienced and respected clinicians in the field of personality assessment. These clinicians contend that drawing techniques are not subject to validation, and consequently, validation is an irrelevant issue (DiLeo, cited in Bolander, 1977; Hammer, 1981; Klepsch & Logie, 1982). Case studies are frequently offered as evidence and validation for the claims made (e.g., Goodenough & Harris, 1950; Burns & Kaufman, 1970, 1972; Schildkrout, et al., 1972; Hammer, 1981; Burns, 1982; Klepsch & Logie, 1982). These case study reports typically focus on pathological drawing features derived from untested theoretical ideas without first ootaining seemingly readily available base

rate information. As one example of disregard for standard test development procedures, Bolander (1977) made the following statement when describing the origins of the Tree Drawing Test: "We have abandoned all practices of standardization of materials and administration procedures, with the single exception of providing paper which is in relatively close proportion respecting the vertical and horizontal dimensions" (p. 58).

Actuarial drawing techniques:

Recently, some investigators of children's drawings have applied actuarial techniques to the data collected from clinical and non-clinical child populations to develop reliable and valid scoring systems. Although the traditional drawing test themes and instructions are employed when obtaining the drawings, the scoring systems are based upon atheoretical and empirical data rather than upon psychodynamic conceptualizations. Presuppositions regarding the presence or absence of pathological signs are not made. The preliminary results obtained suggest that actuarial techniques offer promise for reliable discriminative assessment. Hiler and Nesvig (1965), among the first researchers to apply actuarial techniques to children's drawing assessments, looked at the frequency of omissions and comissions of specific drawing content produced by different diagnostic groups. Four variables were identified which significantly differentiated drawings made by clini-

cal and non-clinical adolescents. These variables were labelled Bizarreness, Incompleteness, Distortion, and Transparency. Hiler and Nesvig developed an actuarial formula from these data and instructed graduate clinical students in the scoring system. Comparisons between the discriminative accuracies of these trained students and experienced clinicians were then conducted. The students averaged 79% accuracy in distinguishing between drawings made by maladjusted and normally adjusted adolescents, while the experienced clinicians and non-psychologists not using the formula averaged 64% and 65% accuracy, respectively. Striker (1967) replicated the Hiler and Nesvig study using experienced clinicians who were allowed to use the scoring they typically used, and first and third year graduate clinical psychology students who were trained in the use of the actuarial formula. The experienced clinicians achieved an average 67% accuracy as compared with an average 72% accuracy for the first year and 73% for the third year students.

In summary, applying actuarial techniques to the development of scoring systems for drawing tests has produced potentially promising results. These data, although in need of further replication, do suggest that non-traditional approaches to drawing assessment without ties to a particular theory offer potential for significantly greater accuracy when differentiating between drawings made by emo-

tionally disturbed and non-disturbed children.

Conclusions and Recommendations:

Conclusions may be drawn from this brief review of the DAP/DAM literature. First, the use of children's drawing techniques for personality and intellectual assessments has a long history and a respected position within Clinical Psychology. As evidenced by the popularity of the tests, their demise as clinical assessment tools does not seem imminent. However, the empirical justification for the traditional drawing assessment techniques is limited and is far out-weighed by the evidence against their use. Not only do the traditional drawing tests appear to be unreliable as currently used, but evidence also suggests that clinicians experienced in their use are unable to consistently employ them for effective discriminative clinical analyses.

Thus, it appears that a contradiction exists; many clinicians are committed to an assessment device that has little empirical justification. It would seem that either clinicians should discontinue the traditional use of the drawing techniques or rethink the assessment goals of drawing tests. The survey data suggests that it is unlikely to expect drawing techniques to be discarded in the foreseeable future; therefore, the first option is an unlikely solution. Furthermore, there probably exists in psychology, as in other disciplines, a tendency to retain an imperfect

idea (or in this case, a test) until a better replacement is offered. Therefore, the second option may be the more reasonable solution. Application of actuarially derived scoring methods to personality drawing assessment may be one possible alternative. However, the scoring method seems to have had no noticeable impact among child clinicians. A second alternative will now be discussed; an approach emphasizing a merger of developmental and clinical research.

Developmental research on children's drawings:

This historical review of children's drawings in psychology has shown that much of the research and applied focus has been on drawings for personality and intellectual assessments. However, a separate and distinct line of child developmental research paralleled this history and will now be discussed.

At the time when the clinical research focus was upon the art of the insane, Luquet (1913, cited in DiLeo, 1970, 1977) reported the results of a five year longitudinal study of his daughter's drawing development. Luquet collected and analyzed over 1700 drawings made by his daughter when she was between 3 and 8 years old. From these data, he described distinct developmental stages characterizing progress in children's drawing abilities, stages that are still generally accepted today by authorities in the area of child development (e.g. Lowenfeld, 1947, 1954;

Kellogg, 1969, 1979; Golumb, 1973; Gaitskell, 1975; Goodnow, 1977; Gardner, 1980). Goodenough and Harris' (1950) review of the developmental drawing literature indicated that interest in children's drawings continued into the early decades of this century. However, there has been a resurgence of interest in children's drawings within the last 20 years among child developmental and experimental child psychologists. The results obtained from these various investigations have the potential to significantly impact the traditional use of drawings among child clinicians.

Minimal communication of ideas and findings between clinical and developmental psychologists has occurred in the area of children's drawings, and what little has occurred has often been disparaging (e.g., Kellogg, 1979). One likely reason for the lack of information exchange is the disparate goals and objectives of the two disciplines. While clinical child research has focused on the development of personality and intellectual assessment techniques to differentiate between children, the developmental research has focused on the more general goals of understanding child development and cognitive processing as revealed through children's art productions. As such, the developmental research has been more concerned with group performance than with individual differences, the latter of which has characterized the clinical drawing research.

The very different preconceptions of the two research models are perhaps the major obstacles hindering communication of ideas. As has been previously demonstrated, much of the clinical research on children's drawings has been tied to the psychodynamic understanding of drawings as presented by Machover (1949) and Koppitz (1969). Depending upon the particular orientation of the researcher, attempts have been made either to justify or refute the Machover assessment technique. While the psychodynamic model of personality drawing assessment provides a well-defined structure for clinical research, it also tends to direct the clinical research into seemingly unproductive areas. Consequently, the accumulated clinical research has generally been less concerned with questions of better understanding the child than with justifying a particular assessment technique. Furthermore, since it has been repeatedly demonstrated that traditional drawing analysis is an unreliable means for personality assessment, much of this accumulated research has little value.

However, the developmental literature on children's drawings is based upon different preconceptions and has tended to be less tied to a single theory or theories. Much of the developmental literature on children's drawings has been descriptive in character. For example, Kellogg (1969) collected over 10,000 drawings from predominantly pre-school children and used these data to make observa-

tional statements regarding the development of children's drawing skills. Her work characterizes much of the developmental research which emphasizes baserate information regarding children's drawings and variables affecting the drawing product. For these reasons, the accumulated developmental literature on children's drawings has much to offer clinical child psychology.

Ramsden and Coon (1984) reviewed in detail the developmental literature on children's drawings with implications for clinical child assessment. They provide several examples of applications of developmental research findings to clinical decision-making based upon children's drawing data. Some of their findings and conclusions will be briefly considered as an indication of the potential application these data may have for clinical psychology.

The depiction of movement in human figure and animal drawings is an area that has received much attention by developmental psychologists and also represents an issue of significant importance for the clinical understanding of drawings. Moreover, the research designs used in these investigations may be useful models for clinical research. Goodnow (1978) reported that young children are much more capable of recognizing movement in drawings or pictures than they are of producing movement in a recognizable form in their drawings. She found that when asked to draw a picture of a person picking up a ball from the ground,

children below 9 years of age did not draw bends in their body parts to depict the movement necessary for picking up a ball, but instead drew vertical figures with elongated arms that seemed to "grow" to reach the ball. Korzenick (1978; cited in Gardner, 1980) reported that 5-7 year old children were unable to depict jumping movements in their drawings so that other children viewing the finished product could accurately recognize the intended movement. Furthermore, when given feedback on their drawings, these same children were unable to modify their figure drawings to increase the frequency of recognition by peers. Friedman and Stevenson (1975), Ives (1980), and Ives and Rovet (1979) reported that the orientation of the figure drawn is a critical component in the child's depiction of movement. For example, when a child draws a person talking, the figure is typically presented from a side view rather than a frontal orientation.

In combination, these observations suggest that a child's depiction of movement in a drawing involves complex production and conceptual processes that need to be considered when interpreting personality characteristics from the figure drawing. For example, with the Kinetic Family Drawing Test (KFD), the child is instructed to draw a picture of the family doing something together, a request which implies movement. The observations of Goodnow (1978) and Korzenick (1978; cited in Gardner, 1980) suggest

that the ability to graphically represent reliably recognizable movement in a drawing does not occur before 9-10 years of age, and even then considerable individual differences may be anticipated. Thus, clinical decisions based on a child's KFD can be erroneous and misleading if the child's developmental age is not accounted for when making these decisions.

Golumb (1973, 1974) investigated the effects of the artistic medium on the child's final product and concluded that the art medium has significant implications for the quality and content of the work. Golumb demonstrated that considerable differences exist between children in their abilities to produce well-articulated human figures when using different media (e.g., clay, human figure jigsaw puzzles, drawing completion tasks). This observation was particularly salient with younger children (3-4 years old). Other researchers have confirmed these observations (McNamara & Porterfield, 1969; Celotta, 1973; Bassett, 1977). These studies also provided additional evidence that children's recognitions of well-articulated human figures precede their abilities to produce them (Macoby & Bee, 1965). Therefore, omissions or distortions in children's drawings of the human figure may be more properly conceptualized as an issue of drawing competence rather than personality maladjustment.

The spatial orientation of the figure drawn (and other

spatial referents on the sheet of paper) represents a third line of developmental research with significant implications for clinical assessments. Barnhart (1942), Freeman (1976, 1977, 1980), and Goodnow and Friedman (1972) have observed that the process of children's drawings follows a temporal sequential organization rather than a geometri- geometrically referenced organization. Unlike children, adults tend to organize their drawings around the spatial limitations of the paper, that is, the horizontal and vertical boundaries. However, young children tend to use temporal sequencing. Each mark on a paper re-defines the picture in progress for the child and determines the consequent marks to be made. Temporal sequencing has been used to account for the irregularities frequently found in children's drawings. For example, the slanted chimneys in house drawings and the irregular depiction of human body parts (from an adult perspective) may be attributed to temporal sequencing. These observations suggest that the temporal ordering of a child's drawing needs to be considered when using drawings for clinical assessment. Errors can be made when interpretations are based solely on the final product.

Lowenfeld (1954) offered an alternative, psychodynamically-oriented explanation for the irregularities found in children's drawings. He suggested that children are cognizant of and intentionally employ these irregularities

in their drawings to represent the horizontal and vertical characteristics of the objects in their drawings. Lowenfeld's ideas have not been empirically verified.

There are other examples from the developmental research literature that have implications for the clinical understanding of children's drawings. Vicarious observations and in vivo modeling have been demonstrated to alter the content of children's drawings (Adler & Berkowitz, 1976; Wadeson & Carpenter, 1976; Winer & Brandenbury, 1977), as have verbal instructions (Golumb, 1973, 1977; Burns & Velicer, 1977; Ives & Rovet, 1979; Ives, 1980), short-term changes in emotional states (Britain, 1970; Silverstein, 1970), long-term socio-environmental influences (Reichenberg-Hackett, 1964; Dennis, 1966a, 1966b; Dreyer & Rigler, 1969), effects of time (Hammer & Kaplan, 1964a, 1964b; Gellert, 1968; Brittain, 1969; Laosa, Swartz, & Holtzman, 1973; Stacey & Ross, 1975; Goodnow, 1977; Burns & Velicer, 1977), and seasonal cues (Craddick, 1962, 1963a, 1963b; Coyle & Eisenmann, 1970), to name a few. These various data suggest that children's drawing products represent complex cognitive and organizational accomplishments. Therefore, investigators of children's art need to consider the characteristics of the child, the child's developmental progress, the unique characteristics of the drawing situation, and the medium of art expression when attempting to understand drawings. It is probably naive to

asssume that one or two drawings made by a child at any given time will reliably represent a sample of the child's functioning. Goodnow (1977) contends that drawing analyses can be most effectively used as a means for understanding a child's unique problem-solving capacities and strategies.

This brief and selective review of the developmental child drawing literature suggests the need for intra-disciplinary communication between clinical child and developmental researchers. The results of these various investigations have direct implications for better understanding children, and therefore, can lead to more accurate assessment decisions. Furthermore, a merger of ideas will likely provide the clinical child psychologist with a different, and, consequently, more comprehensive perspective on child development and clinical assessment.

One area of research that has been investigated by clinical and developmental researchers will now be considered in detail. This area is the expression of affect in human figure drawings by children. Rather surprisingly, this topic has received relatively little attention by clinical researchers, in spite of its apparent significance for personality assessment.

Affective Content in Children's Drawings: Clinical Child Research

Clinical child research on expression of affect in

human figure drawings has generally been consistent with much of the clinical child drawing research, in that it has been directed towards confirming or refuting the Machover (1949) and Koppitz (1969) ideas regarding projective drawing tests. Interestingly, neither Machover nor Koppitz directly address the issue of affective expression but rather they look for "signs" in the drawings which suggest emotional adjustment or maladjustment, and from these make inferences regarding the child's affective state. It is assumed that the child "projects" his/her affective state into a drawing and, in particular, into the facial expressions (Machover, 1949). From this perspective the symbolic, and, therefore, indirect indicators of emotional functioning are of clinical concern.

Koppitz (1969) identified 30 Emotional Indicators whose presence or absence in a drawing is believed to be indicative of emotional distress in children. These indicators are grouped into three general categories: quality of the drawing, items typically omitted in drawings, and omissions of items typically included in drawings. Several investigators have compared the Emotional Indicators from the drawings made by emotionally-disturbed and non-disturbed children. The results obtained have generally failed to support Koppitz' claims, suggesting that the Emotional Indicators do not effectively discriminate between clinical and non-clinical populations. However, Koppitz'

Emotional Indicators do not directly tap affective expression. The indicators are primarily intended to differentiate between groups of clinical and non-clinical children. Koppitz (1969) contended that affective expression is best determined through an interpretation of the content rather than the structure of the drawing. Structure refers to the physical aspects of the drawing such as line quality, size of figures, placement on paper, and so forth, while content refers to the subject matter of the drawing. However, Koppitz did not elucidate how to reliably interpret drawing content, and generally attributed accuracy of affective perception in drawings to undefined clinical skills. Thus, Koppitz' system does not objectively quantify differences between affective expressions.

The clinical child research literature, as a whole, has not directly addressed the issues of affective expression in figure drawings. Typically, differences are investigated between groups of children with identified behavioral characteristics assumed to be associated with specific affective states. For example, comparisons have been made between high and low self-esteem children, with the assumption that low self-esteem children will produce more sad affect in their drawings than will high self-esteem children. Britain (1970) compared family drawings made by 4-5 year old nursery school children, some of whom had been verbally criticized while others were praised for their

performance on a Tinker Toy building task. Britain reported significant differences between the groups of children for the height of the self figure, the number of figures drawn, and the quality and elaboration of the drawings. Coopersmith, et al. (1976) reported that children with higher self-esteem tended to draw more explicit and realistic hands on their human figures; otherwise, there were no differences between the figures drawn by high and low self-esteem children. Dalby and Vale (1977) reported no differences between the human figure drawings made by high and low self-esteem children. Silverstein (1966) investigated differences in drawings made by anxious and calm children, and reported that the highly anxious children drew "poorer quality" human figures than the non-anxious children. However, significant design problems with each of these studies limits the generalization of the findings.

Although it is generally assumed that children of various ages can graphically depict a number of affective expressions, this assumption has not been directly and empirically assessed by psychologists, nor have the conceptual ideas been clearly operationalized.

Developmental Research

Expressions of specific affective states in humans have been consistently identified and subsequently applied to the understanding of the devlopment of affective expression in children. Darwin initiated this line of research

in the latter part of the 19th century when he made detailed observations of the facial expressions of non-human primates (1872, cited in Ekman, 1973). He believed the primate behaviors were indicative of analogous development of facial expressions among humans. Gates (1923, 1925) and Dashiell (1927) were the first investigators to specifically look at children's recognition of affective states. Gates presented photographs of an adult displaying six different affective expressions (i.e., anger, joy, pain, surprise, scorn, and fear) to 3-14 year old children and undergraduate college students who were then asked to identify the various affective expressions. Gates found that the younger children had much more difficulty recognizing and identifying the different expressions than did the older children. She also observed that children of all ages, and particularly the younger children, had more difficulty differentiating the subtle differences in affective expressions, such as anger and pain, than differentiating between extreme affective expressions, such as happiness and anger. Gates delineated the ages at which 50% or more of the children correctly identified each affective expression and reported the following: joy - third year; pain - sixth year; anger - seventh year; fear - tenth year; surprise - eleventh year; and scorn - twelfth year. Among the adults, joy and scorn were correctly identified by all subjects; fear by 98%; anger by 95%; pain by 89%; and sur-

prise by 84%. Gates reported non-significant sex and SES differences for the children.

Dashiell (1927) described an alternative technique for presenting the photographs. The children were simultaneously shown three pictures of different affective expressions while listening to a story read by the examiner. The children were then asked to point to the picture with the facial expression best reflecting the feelings of the story. Unfortunately, Dashiell only described the technique used and not the results of the investigation.

Children have been shown to recognize several different affective expressions, although the absolute number varies somewhat between investigators. The facial muscles manipulated for these different affective states have been extensively studied, so that reliable modeling of these emotional expressions is possible for research purposes. (Izard, 1971, 1977; Ekman & Friesen, 1975, 1978; Camras, Grow, & Ribordy, 1983). The emotional expressions most frequently cited in the child literature are: anger, fear, happiness, sadness, surprise, and disgust (Ekman & Friesen, 1971; Izard, 1971, 1977; Ekman, 1973; Charlesworth & Kreutzer, 1973; Camras, et al., 1983). Ekman and Friesen (1971) demonstrated that these basic emotional expressions exist cross-culturally. In their study, pairs of photographs of human models depicting these six affective expressions were presented to isolated New Guinea natives, who then re-

quested to identify facial expressions that best represented affective states associated with story themes. The New Guinea tribesmen were as successful in identifying the different affective expressions as were Western subjects.

Although children are capable of recognizing a variety of affective expressions, it is unclear how many different affective expressions children can display, either through artistic representations or modeling. There is evidence suggesting a developmental lag exists between the abilities to produce and recognize the different expressions, such that the ability to recognize precedes the ability to produce affective expressions. For example, Odom and Lemond (1972) investigated differences in the abilities of kindergarten and fifth grade children to identify eight affective expressions when presented via photographs of human faces. After observing a particular affective expression, the children were asked to model the same facial expression. The children's responses were then photographed. The results indicated that the older children produced a greater number of correctly identified affective expressions than did the younger children. However, for both age groups, more affective expressions were recognized in pictures than were modeled by the children.

Relatively little of the research literature on children's recognition and expression of affect has addressed these issues through the medium of drawings. However, the

few studies in this area have significant implications for the use of human figure drawings in clinical child assessments. Strattner (1963) was the first to investigate the developmental differences in children's abilities to recognize and identify affective expressions in human figure drawings. Her work was conceptualized from a developmental framework, and therefore, the figure drawing tasks she employed were significantly different from those used in the traditional HFD tests. In her study, 3-7 year old children were presented with two sets of graphic stimuli. These stimuli were carricature drawings of human faces and human body postures. Three different affective expressions were depicted in the face series (i.e., happiness, sadness, and anger), and two affective expressions were depicted in the posture series (i.e., sadness and happiness). The faces were depicted as 2 1/4 inch circles with alterations made in the mouth and eyebrow cues to indicate different affective qualities. The hair, nose, and ear features were held constant across conditions. Stick figures with variations in head, arm, and leg positions were presented in the posture series of pictures.

Strattner (1963) compared three different methods for assessing affective recognition. In the first condition, some of the children were presented the drawings, one at a time, and asked to identify the appropriate affect. For example, the examiner would present a picture to the child

and ask, "How do you think this boy feels?". In the second condition, the children were presented the drawings in pairs and asked to identify the drawing matching an affective adjective given by the examiner. For example, after presenting a happy and sad face to a child, the examiner might say, "Which one (picture) looks like he feels happy?" In the third condition, in addition to the pairs of drawings presented to the children, the examiner provided a "suggested affective context" for the drawings. For example, after presenting happy and sad pictures, the examiner might say, "Which one looks like he got some new toys to play with?". Strattner made several conclusions from the results, but the most consistent finding was that the ability to identify and discriminate between affective states increases with age, regardless of the method of presentation. These observations are consistent with those by Gates (1923), Izard (1971), and Ekman and Friesen (1971) when using photographs. Additionally, children of all ages were better able to discriminate between positive and negative affective states, such as happiness and sadness, than between less dichotomous affective states, such as anger and sadness. Furthermore, children identified positive affective expressions at younger ages than they did the negative affective expressions. Strattner reported few differences between the three experimental conditions in the children's response accuracy, although she did note lowest

response accuracy for the "suggested affective context" condition. Alteration of the eyebrows in the face series was determined to be the critical variable differentiating affective expressions, while the mouth cue alone was the least important determinant, particularly with younger children. The position of the head was the best indicator of affective differences in the body posture series.

Carothers and Gardner (1979) assessed differences in recognition and production of graphically displayed affective expressions among 7-12 year old children. In their study, pairs of identical drawings were presented to the children in which the affective content of each picture was varied. One drawing represented happiness, while the other represented sadness. For example, one pair of pictures consisted of a man walking by a store. In the happy picture, the man is running, the store looks successful, and the sun is shining with no clouds in the sky. In the sad counterpart drawing, the man is walking slowly with his head down, "Closed" and "For Sale" signs are in the store windows, and the sun is blocked by an overcast sky. After viewing the two pictures, the children were asked to draw pictures of two familiar objects depicting the same two affective qualities represented in the drawings. For example, in one condition the children were asked to draw a "happy tree" and a "sad tree". Thus, the task demands required the children to first identify the affective expres-

sion represented in the stimulus picture and then to produce the same affective quality using a different content theme. The results indicated that the 7 year old children were unable to represent different affective qualities in their drawings as measured by this task, while older children were more successful. However, this task required complex problem-solving strategies, and therefore the intentions of the study may have been confounded by the complexities of the task requirements. In the second part of the study, the same children were presented with similar pairs of happy and sad drawings and asked to identify the pictures representing happiness and sadness. This procedure represented a more direct measure of affective recognition, and consequently, the younger children were much more successful with this task. However, they were still significantly less accurate than were the 12 year old children. Thus, it appears that the recognition of affect by children precedes the production of affect in drawings.

Ives (1980) distinguished between abstract, literal, and content expression of affective content in children's drawings, and contends that young children are capable of recognizing and depicting a wide variety of affective qualities in their drawings. However, their style of expression may differ from the style commonly used by adolescents and adults, and consequently, will not always be recognized by adults who view the pictures. According to Ives, liter-

al expression of affect involves the physical expressions of the human figure, such as a crying face, while abstract and content expressions represent metaphorical qualities. Abstract features would include the medium selected, the intensity of the line quality, the colors selected, and so forth. Content features refer to non-human aspects of a drawing which suggest affective expressions. For example, a barren tree might represent sadness.

Ives (1980) compared the structured drawings of 4, 5, 7, 9, 11, 13, 16, and 20 year old subjects. He compared the ability of the subjects to differentially depict affective (i.e., sad, happy, and angry) and sensory (i.e., hard, loud, and soft) qualities in drawings when using specific representational (e.g., tree) and non-representational (e.g., line) drawing themes. The task of each subject was to draw 12 pictures such that six "trees" and six "lines" were to represent the six sensory and affective qualities. Ives concluded, in agreement with Carothers and Gardner (1979), that children's abilities to express affective qualities in drawings generally improve with age. However, Ives reported that the improvements were not consistently progressive with the children in his sample. Children between 9-11 years of age showed decreased abilities to depict affective qualities in their drawings. Furthermore, the developmental differences were a factor of the mode of expression. Thus, the exclusive use of abstract or content

expression showed a progressive increase with age, while a combination of literal and abstract exoression showed no consistent trend. Abstract expression of affective quality was the style most frequently employed for all ages, with the exception of 5 year old children for whom literal expression was used most frequently. As was anticipated by Ives, the children were better able to depict the affective moods than they were the sensory qualities. Furthermore, it was observed that the children had less difficulty representing extreme affective states, such as sadness and happiness, than representing less distinct affective states, such as sadness and anger, which is consistent with Strattner's (1963) conclusions. Finally, it was observed that the children were capable of depicting affective qualities in their representational drawings so that the adult judges could accurately identify the different affective expressions.

Camras, et al. (1983) recently investigated recognition of affective expression by abused children and obtained results with implications for clinical child assessments. The abilities of 17 abused and 17 non-abused children between 3-6 years of age to identify six facial emotional expressions (i.e., happiness, sadness, disgust, fear, surprise, and anger), as presented in photographs of child models, were compared. The children were read 12 brief story themes (two for each affective state) depicting

the six emotional states. For example, one of the happiness story themes was, "It is his/her birthday and he/she is happy". After hearing the brief story themes, the children were asked to choose one of three photographs of a child that best represented the affect expressed in the story. Camras, et al. concluded that the abused children were less accurate than the non-abused children in identifying each of the six affective expressions. Additionally, the children in this sample, abused and non-abused combined, were better able to identify happiness, sadness, and anger, than they were fear, surprise, and disgust. This finding is consistent with previous research observations (Strattner, 1963; Ives, 1980). Although the small sample size and the limited age range of the children in this sample cautions against conclusive statements, these results suggest that affective recognition can be significantly altered by environmental influences, and as such, the procedure has potential for clinical applications.

In summary, these various research reports suggest that the recognition and expression of affect represent developmental phenomena, in which age progressions occur in the abilities of children to identify and and graphically depict different affective expressions. Apparently, the specific affective states develop at different rates. For example, it appears that children recognize positive affective expressions, such as happiness, before they recognize

negative affective expressions, such as sadness.

Summary and Recommendations for Research

In this review of the psychological interest in children's drawings, several observations and recommendations for future research were made. It was observed that traditional psychological drawing assessment techniques, such as those developed by Goodenough (1926), Machover (1949), and Koppitz (1969), hold an honored position among, and are currently extensively used by many practicing child clinicians. However, the vast amount of research generated has consistently failed to substantiate their continued use as traditionally employed.

The understanding of children's development as indicated through drawings has received much attention by developmental psychologists. Unfortunately, the important clinical information obtained as a by-product of this research has had little impact upon the assessment practices of many clinical child psychologists using drawing techniques. The need for intra-disciplinary communication of ideas and research findings is strongly recommended as one means for obtaining a better understanding of a child's functioning through drawing data and for altering the direction of the clinical child drawing research.

The expression of different affective states through children's drawings was identified as an area of clinical interest that seems appropriate for an integration of clin-

ical and developmental research ideas. Rather surprisingly, affective expression in drawings has received little attention by clinical psychologists despite its apparent significance for personality assessment. In contrast, affective expression in children's drawings has been directly investigated by developmental researchers. Moreover, the observations regarding affective expressions reported in the developmental literature have relevance for clinical research and clinical practice. For example, evidence has shown that the abilities to produce recognizable affective expression in drawings increase with age (Gates, 1923; Strattner, 1963; Odom & Lemond, 1972). This observation has obvious implications for clinical child assessments based upon drawing test data. When a clinician uses drawings to infer affective functioning in a child, the clinician needs to carefully account for the child's age in relation to the child's ability to produce specific affective qualities in drawings.

The present study investigated the abilities of adults to correctly identify children's attempts to graphically depict common affective expressions in human figure drawings. A descriptive, developmental research design was applied to address clinically-relevant questions. The primary goal was to determine the ages at which children attain the abilities to draw six common affective expressions such that the intended affective expression can be reliably

identified by adults viewing the drawings. The most basic experimental question was, "Can adults identify children's representations of specific affective expressions in human figure drawings?". Additionally, the relative effects of potentially pertinent independent variables on the accuracy of affective recognition were investigated. These variables included the professional training of the adult rater, sex of the adult rater, and sex of the child artist. This study represented an initial determination of baserate information regarding the depiction and recognition of affective expressions in children's drawings. Consequently, no specific predictions were made regarding outcome.

Method

Subjects

Children: A total of 153 kindergarten, second, fourth, sixth, eighth, and tenth grade children provided drawings for use in the current study. The children were recruited from the teaching laboratory school at the University of Florida, Gainesville, which maintains a student population balanced on the county's race, sex, and SES demographics. Thirty students (15 females and 15 males) were randomly selected from the grades sampled and recruited through letters and telephone calls to the students and their parents. From this sample of 180 students, 153 (80 females and 73 males) returned the necessary consent forms and completed the experimental protocol. Thus, the distribution of students by grade and sex who produced drawings were as follows: kindergarten- 11 females, 13 males; second grade - 17 females, 12 males; fourth grade - 16 females, 14 males; sixth grade - 13 females, 13 males; eighth grade - 13 females, 10 males; and tenth grade - 10 females, 11 males. The age, race, and sex characteristics of the students sampled and included in the experimental sample are presented in Table 1.

Adults: Thirty-six adult raters (18 females and 18 males) from three distinct occupational groups reviewed the children's drawings. The groups were: Clinical Child Psychologists, Clinical Psychology Graduate Students, and

Table 1

Age, Sex, and Race Characteristics of Student Population and Students in the Experimental Sample.

Grade	n	Mean Age	SD	Per Cent Female	Per Cent Non-White
Kindergarten					
Class	48	6.13	.32	52.1	20.8
Sample	12	5.99	.32	50.0	0
Second Grade					
Class	53	8.12	.31	52.8	24.5
Sample	12	7.92	.31	50.0	0
Fourth Grade					
Class	61	10.07	.75	51.6	21.3
Sample	12	9.91	.39	50.0	0
Sixth Grade					
Class	61	12.03	.42	47.5	19.7
Sample	12	11.99	.49	50.0	25.0
Eighth Grade					
Class	62	13.95	.44	50.0	19.4
Sample	12	13.77	.39	50.0	25.9
Tenth Grade					
Class	95	15.93	.66	48.4	18.9
Sample	12	15.89	.40	50.0	8.3

Adults in Non-Mental Health Occupations. Age and sex characteristics of the raters are presented in Table 2.

a. Child Psychologists:

In order to be classified as a Clinical Child Psychologist, a Ph.D. or Psy.D. in clinical psychology with either a clinical child training specialty or general clinical training and current professional work with children was required. Age, sex, and experience with drawing techniques are reported in Tables 2 and 3. As can be seen, the psychologists were generally well-matched on pertinent variables. Among the psychologists in the sample, 10 (5 female and 5 male) received specialty training in clinical child psychology; two received general training and were employed in child clinics with primary responsibility for child and adolescent psychological assessments. The females, as a group, reported more years in post-Ph.D. clincal work with children and adults ($\bar{X}$= 7.8 years for females; $\bar{X}$= 5.3 years for males), although the total years of clinical work with children were essentially equivalent ($\bar{X}$= 8.0 years for males; $\bar{X}$= 7.8 years for females).

Evidence of the Clinical Psychologist's familiarity with and use of drawing techniques was obtained with a series of 5-point Likert self-report scales (Appendix) and reported in Table 3. As indicated, the use of drawing techniques for developmental assessments was most frequently reported.

Table 2

Age and Sex Characteristics of the Adult Raters

Rater Group	Age							
	Female			Male			Total	
	$\bar{X}$	SD	Range	$\bar{X}$	SD	Range	$\bar{X}$	SD
Child Psychology	35.2	8.3	28-50	34.7	4.5	29-41	34.7	6.4
Graduate Students	26.8	6.6	23-40	24.6	.9	24-26	25.8	4.8
Non-Mental Health	30.8	8.4	20-40	27.5	11.2	19-49	29.2	9.6
Total	30.9	8.1	20-50	28.4	8.0	19-49	29.7	7.9

Table 3

Use of Drawings In Clinical Practice

Assessment Application	Female $\bar{X}$	Female SD	Male $\bar{X}$	Male SD	Total $\bar{X}$	Total SD
Child Psychologists (Current Use)						
Developmental	3.2[1]	.9	4.3	1.2	3.7	1.2
Intellectual	2.3	1.0	2.7	1.5	2.5	1.2
Personality	3.6	1.1	2.7	1.2	3.1	1.2
Rapport	3.3	.8	3.2	.9	3.3	.9
Average of drawing tests	3.1	1.0	3.2	1.3	3.1	1.2
Graduate Psychology Students (Anticipated Use)						
Developmental	4.2	.9	3.9	1.5	3.8	1.3
Intellectual	2.8	1.0	1.9	.5	2.4	1.2
Personality	3.5	1.5	4.0	1.3	3.8	1.4
Average of drawing tests	3.5	1.4	3.1	1.5	3.3	1.4

[1] Scores ranged from 1 to 5 with higher scores indicating more frequent use.

b. Psychology Graduate Students:

The graduate student raters were recruited from the Graduate Clinical Psychology program at the University of Florida, Gainesville, and were at a pre-Master's level in their training. These students are exposed to a wide variety of clinical experiences through the required child assessment practicum at the Child Psychology Clinic at Shands Teaching Hospital, which is the medical training facility for the state of Florida.

Six of the students (4 male and 2 female) reported prior training in the use of drawings for intellectual assessments. Ten (6 male and 4 female) and seven (4 male and 3 female) students received training in the use of drawings for personality and developmental assessments, respectively. Information regarding the students' expected future utilization of drawing techniques are reported in Table 3. As indicated, the graduate students anticipated more frequent use of drawing techniques for developmental and personality assessments than for intellectual assessments.

c. Non-Mental Health Raters:

These raters represented a diverse group of ages, occupations, and experiences with children. Occupations included real estate broker (n=1), junior or high school teacher (n=2), college student (n=3), construction worker (n=1), clerical worker (n=2), professional artist (n=1), bank teller (n=1), and telephone operator (n=1). Two of

the male raters and three of the female raters have children, with ages ranging from 2 months to 21 years. All but one rater reported some previous work experience with children. These experiences included babysitting/childcare (n=8), child and youth social-activity groups (n=4), camp counselor (n=3), and for one male rater, administration of a child day care center.

Stimuli:

The students were requested to make six drawings of human figures displaying six affective expressions, i.e., happiness, sadness, surprise, anger, fear, and disgust. These expressions have been demonstrated to be consistently recognized and expressed cross-culturally by children (Ekman & Friesen, 1971, 1978).

The experimental protocol was administered to one or two children at a time for the kindergarten grade children and in groups of approximately 10-15 children for the other grades. The duration of the administration sessions ranged from 30-45 minutes, and typically occurred in the child's classroom or the school's library. The students were presented with a test booklet comprised of a demographic data sheet and six sheets of unlined white paper (8 1/2" X 11"), and a black medium point Flair felt-tip pen. The experimental sessions were conducted by four people, including the author and three undergraduate psychology students participating for research class credit. The assistants were

trained in the experimental procedures and all instructions were read from a prepared script. At least two experimenters were present for testing sessions with second, fourth, sixth, eighth, and tenth grade students; one experimenter was present for testing sessions with kindergarten students.

Story themes, similar to those used by Camras et al., (1983) and Ekman and Friesen (1971) were used to introduce each of the affective expressions and to provide a context and definition for the desired affective state. The following instructions were read to the children: "We all share common feelings that we show at different times and in different ways. For example, each of us has been surprised, scared, angry, and happy at different times. Today, we would like you to draw pictures of people showing different feelings. We are interested in how people draw feelings in pictures, and we are not concerned with how good your pictures look; only do the best you can. There are no right or wrong ways that these pictures are to be made."

"On the first page, I would like you to draw a picture of a person who looks happy. You might imagine a boy or girl is having a birthday party, and all of his or her friends are over at the house. This boy or girl feels <u>happy</u>. Without including a picture of a birthday party, draw me a picture of a person who feels happy. I'll give

you a few minutes to make your drawing. Do the best you can within that time. Remember, only draw the person; don't draw the party. Also, draw only one person. If you make a mistake and want to start over, you may use the back side of the page."

Similar instructions were provided for the remaining affective stimuli. The instructions emphasized drawing a a single figure and omitting the contextual content provided by the vignettes. Five minutes were allowed for each drawing, although most of the childen finished within two or three minutes. The order of presentation of the affective expressions was randomly determined and consistent for all students.

The other story themes in order of presentation were as follows:

Disgust: You might imagine that a boy or girl has bitten into an apple and found a smelly, squashed dead worm. This person feels disgusted.

Surprise: You might imagine that a boy or girl opened the refrigerator and found six monkeys sitting inside. He or she is surprised.

Sadness: You might imagine that a boy or girl's best friend has just moved out of town, and they will never see each other again. He or she feels sad.

Anger: You might imagine that a boy or girl has just come out of the house and sees some kids beating on his or

her bike with rocks. He or she is mad; he or she is angry.

Fear: You might imagine that a boy or girl is being chased by a hungry lion and is afraid he or she cannot get away. He or she is afraid; he or she is scared.

Following completion of the experimental procedures, the children's drawings were collected and compiled to form two alternative sets of drawings (Sets A and B). Each set consisted of the drawings obtained from 72 students (6 female and 6 male children randomly selected from each grade level). Each student from the experimental sample provided six drawings, one of each affective expression. The order of the drawings in Set A was randomly determined and was the same for Set B. Thus, each set of drawings was comprised of 216 pictures made by 36 children for a total of 432 drawings and 72 children.

Procedure:

The two sets of drawings were randomly assigned to the adult raters with the constraint that three male and three female raters from each occupational group rated Set A and three male and three female raters from each occupational group rated Set B. The adult raters viewed photocopies of the original drawings.

The adult raters identified the affective expressions depicted in each drawing choosing from the six affective expressions presented to the children, and rated the confidence of their selections. Confidence ratings were re-

corded on Likert-type scales with values ranging from 1 to 5; 1 represented "low confidence" and 5 represented "high confidence". Thus, for each drawing reviewed, the adult raters provided two types of data, i.e., an identification of the affect expressed and a self-report measure of rater confidence. In order to avoid response bias, the raters were not informed that each affective expression was represented in an equal number of drawings. A copy of the rater's written instructions are included in the Appendix.

Results

A *t*-test was calculated on the number of correctly identified drawings obtained from the two sets of drawing stimuli presented to the adult raters in order to determine the comparability and representativeness of the alternate sets. No significant difference was obtained. Consequently, all subsequent analyses were calculated from the combined results obtained from Sets A and B.

Three adult raters did not provide answers for all pictures. A female rater from the Non-Mental Health group responded to 213 of the 216 pictures; a male rater from the Child Psychologist group responded to 215 drawings; and, a male rater from the Child Psychologist group responded to 214 drawings. Thus, 7770 of the possible 7776 responses were elicited from the raters.

Accuracy of Recognition:

The capabilities of adult raters to identify the children's affective expressions above chance expectation was a fundamental question posed in this study. Table 4 displays the frequencies and percentages of correctly identified drawings by adult rater. Accuracy of identification ranged from a low of 38.0% for a subject from the Non-Mental group Non-Mental Health group to a high of 66.7% for a subject from the Graduate Student group; the overall recognition rate was 57.7% ($\bar{X}$ frequency= 124.7, *SD* = 12.23). The probability of correctly identifying the affective expression

Table 4
Number and Percent of Correctly Identified
Affective Expressions by Adult Rater

Rater ID	Drawing Set	Rater Group	Sex	Number Correct (n=216)	Percent Correct
1	2	Non-Mental Health	M	131	60.6
2	2		M	123	56.9
3	1		M	132	61.1
4	1		M	113	52.3
5	1		M	120	55.6
6	2		M	116	53.7
7	2		F	129	59.7
8	2		F	81/213	38.0
9	2		F	129	59.7
10	1		F	106	49.1
11	1		F	137	63.4
12	1		F	105	48.6
13	1	Graduate Student	M	137	63.4
14	2		M	126	58.3
15	2		M	128	59.3
16	2		M	141	65.3
17	1		M	139	64.4
18	1		M	126	58.3
19	1		F	144	66.7
20	2		F	126	58.3
21	1		F	119	55.1
22	2		F	124	57.4
23	1		F	143	66.2
24	2		F	115	53.2
25	1	Child Psychologist	M	109	50.5
26	1		M	126	58.3
27	2		M	126/215	58.6
28	1		M	125	57.9
29	2		M	120	55.6
30	2		M	111/214	51.9
31	2		F	128	59.3
32	2		F	127	58.8
33	2		F	134	62.0
34	1		F	127	58.8
35	1		F	130	60.2
36	1		F	127	58.8
TOTAL				4480 (n=7770)	57.7

in any given drawing was one in six, or 16.67%, since the raters selected from six affective choices when reviewing the drawings. Thus, all raters performed significantly above chance expectations.

The percentages reported in Table 4 are absolute measures of accuracy, i.e., the number of correctly identified drawings divided by the total number of drawings presented. A second statistic reported in Table 5, and in subsequent frequency tables, represents an adjusted measure of accuracy of recognition and accounts for the combined errors of omission and commission. An omission error was a failure to correctly identify a given affective expression; a commission error was the incorrect attribution of an affective expression to a drawing. Thus, although 4480 of the possible 7770 drawings were correctly identified, 3320 were incorrectly attributed to other affective expressions. The commission error adjustment reflects the distribution of these incorrect attributions. The adjusted statistic was calculated using the following formula:

$$\frac{\text{Number of Correctly Identified Drawings}}{\text{(Total Number of Drawings Reviewed) + (Number of Drawings Misattributed)}}$$

As an example, 1150 of the 1296 possible Happy drawings were correctly identified. However, an additional 611 drawings were identified as Happy which, in fact, were not

Table 5
Number and Percent of Correctly Identified Drawings by Affective Expression Including Adjustments for Comission Errors

Affect	Correctly Identified	Percent Correct	Comission Errors	Adjusted Percent
Happiness	1150 (n=1295)	88.8	611	60.3
Sadness	1089 (n=1296)	84.0	439	62.8
Anger	683 (n=1296)	52.7	481	38.4
Disgust	597 (n=1295)	46.1	394	35.3
Surprise	512 (n=1294)	39.6	611	26.9
Fear	449 (n=1294)	34.7	754	21.9
Total	4480 (n=7770)	57.7	3290	40.5

Happy drawings. Using the above formula, the adjusted recognition rate would be 60.3%, i.e., 1150/(1296 + 611) = .603). After adjusting for commission errors, the rater accuracy rate dropped to 40.5%, which is still above chance expectation.

Affective Expression:

Determining whether the recognition rates for the six affective expressions significantly differed was the next issue addressed. In addition to the reports of the frequency data, the characteristics of the differences were investigated. A series of t-test comparisons were computed on the confidence ratings for correctly and incorrectly identified drawings as a measure of the raters' cognizance of the accuracy of their selections.

The distribution of correctly identified and incorrectly attributed affective expressions are reported in Table 5. As can be seen, there were notable differences in the identification rates for the affective expressions with Happiness and Sadness recognized at considerably higher levels of consistency than the other four expressions. A tri-modal distribution occurred with Happiness and Sadness recognized with the highest frequency, Anger and Disgust representing a median level of recognition, and Surprise and Fear representing the lowest level of recognition. All affective expressions were correctly identified above chance expectations.

Table 5 also provides information regarding the distribution of commission errors. As indicated, when commission errors were accounted for, Sadness was the most consistently identified expression. However, the tri-modal distribution and the remaining order of frequency of recognition was otherwise consistent for the adjusted and non-adjusted data.

Table 6 displays the distribution of drawings according to attributed affect. Each row sums to 100%, representing all of the drawings for a given affective expression. For example, the first row displays the distribution of the Happy drawings, of which 88.8% were identified as Happy, .9% as Sad, 1.3% as Angry, etc. As indicated, Happiness was the affect most frequently attributed to the drawings, while Sadness which was the most accurately identified expression was least frequently attributed to the drawings. Disgust, Fear, and Surprise were more often misidentified than correctly identified. The last row in Table 6 displays the percentage of all drawings attributed to each affective condition, regardless of the accuracy of the attributions.

The data in Table 6 also provide information regarding trends in the attributional errors. For example, the raters had the greatest difficulty differentiating Surprise from Fear, as indicated by the relatively minimal percentage differences for correct and incorrect attributions of

Table 6

Percentage of Raters' Correctly and Incorrectly Identified Affective Expressions According to the Intended Affect

Children's Intended Affect	Raters' Attributed Affect					
	Happy	Sad	Angry	Disgust	Surprise	Fear
Happiness	88.8	.9	1.3	1.3	1.8	5.9
Sadness	2.7	84.0	5.3	3.9	3.3	.8
Anger	8.8	9.2	52.7	11.9	9.0	8.4
Disgust	10.9	8.6	13.7	46.1	7.8	12.9
Surprise	14.2	3.5	7.4	7.1	39.6	28.2
Fear	10.5	11.6	9.4	9.5	24.3	34.7
All Drawings	22.6	12.8	14.4	15.0	15.6	19.6

Expected column percentages according to chance are 16.67. Percentages are read from left to right with each row summing to 100%.

these two afective expresssions.

Table 7 presents the results of t-test comparisons of confidence ratings given for correctly and incorrectly identified drawings by affective expression. Correlated t-tests were calculated on the average of the summed scores of the correctly and incorrectly identified drawings obtained from each rater for each affective expression. Thus, each rater contributed two scores into the analyses for each affective expression, one score representing the mean of correctly identified drawings and the other representing the mean of incorrectly identified drawings. As indicated, significant differences were obtained for Happiness, Sadness, Anger, and Disgust. In each of these comparisons, significantly higher confidence ratings were obtained for the correctly identified drawings than for the incorrectly identified drawings.

Child Age:

The next step in analyzing the data was to determine whether the age of the child contributed to differences in rater accuracy. Presentations of the descriptive data and the results of a series of repeated measures analyses of variance are reported in Tables 8-29, and will be referred to in this and in subsequent discussions. Two repeated measures analyses of variance were computed for each affective condition; one for the rater accuracy data and one for the rater confidence data. The ANOVAs were computed on

Table 7

Adult Raters' Confidence Ratings: Means and *t*-tests

Affective Expression	$\bar{X}$ Rating: Correctly Identified	$\bar{X}$ Rating: Incorrectly Identified	*t*-test (df=35)	*p*
Happiness	4.29	2.29	8.24	< .005
Sadness	4.17	3.01	6.42	< .005
Anger	3.61	2.88	4.20	< .005
Fear	3.32	3.01	1.59	NS
Disgust	3.37	3.01	2.26	< .05
Surprise	3.30	3.44	-.795	NS

transformed frequency data. Each rater contributed a single score for each Child Age X Child Sex cell, for a total of 12 data points per affective condition. The rater accuracy scores were obtained by summing the number of correctly identified affective expressions per cell. Thus, a cell score could range from 0-3 (i.e., each rater viewed 3 drawings within each Child Age X Child Sex cell per affective condition). The rater confidence scores were also obtained from the Child Age X Child Sex cells for each affective condition, and were the means of the three confidence scores for each cell. Cell values ranged from 1-5.

The overall percent accuracy rate increased from 43.8% (28.1% with commission adjustement) for kindergarten grade children to 64.9% (47.9%, adjusted) for tenth grade children. The age progresssion was consistent with the exception of the tenth grade students, whose drawings were less frequently recognized than were those made by the eighth grade students. Age progressions were less consistent and often not clearly progressive across affective conditions, particularly for the non-adjusted rates. For example, the accuracy rate decreased as a function of increasing child age for Happiness from 94.9% in kindergarten to 82.9% in tenth-grade. More consistent age progressions were noted for the adjusted accuracy rates.

The frequency of accurate recognition tended to show more consistently progressive patterns for Sadness, Anger,

and Fear, while considerably less consistency was noted for Disgust and Surprise.

The results of the repeated measures analyses of variance for rater accuracy data are presented in Tables 9-14. As indicated, significant Child Age effects were obtained for each of the six affective conditions. The distribution of the age differences are reported in Table 30 and graphically presented in Figure 1. As can be seen, the four least accurately identified affective expressions (i.e., Surprise, Anger, Fear, and Disgust) displayed the largest increases in recognition rates with age, while the recognition rates for Happiness and Sadness remained relatively stable, with few exceptions, across all ages.

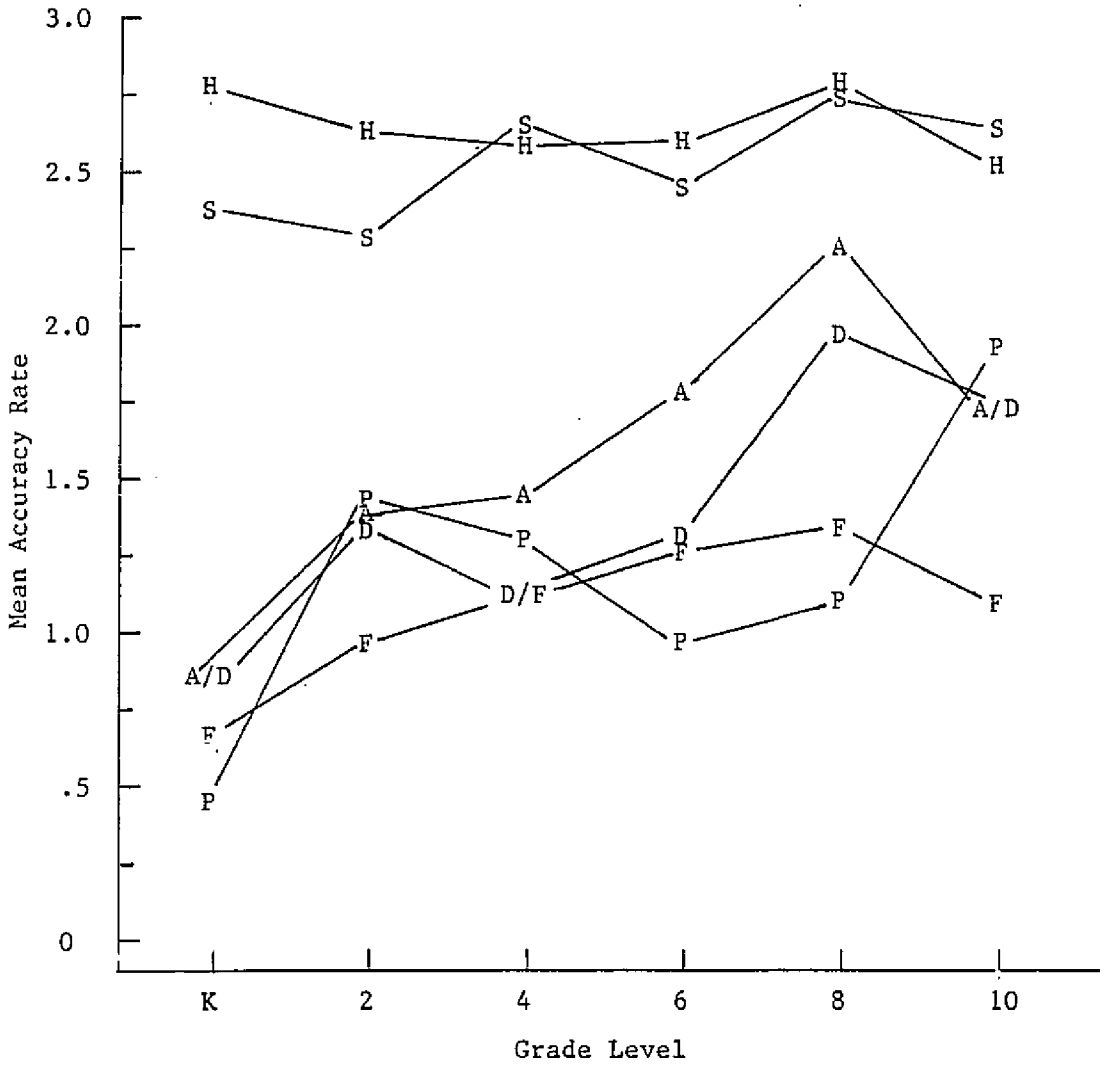
Significant Child Age differences were also obtained from the six analyses of variance on the raters' confidence scores (Tables 15-20). Consistent with the age differences obtained for recognition accuracy rates, the adult raters tended to report lower confidence ratings for the younger children and higher confidence ratings for the older children. The distribution of the age differences are displayed in Table 31 and Figure 2. As can be seen, the raters reported much higher confidence in their ratings of Happiness and Sadness than for the other four affective expressions.

Child Sex:

The results of comparisons of differences in adult re-

Figure 1

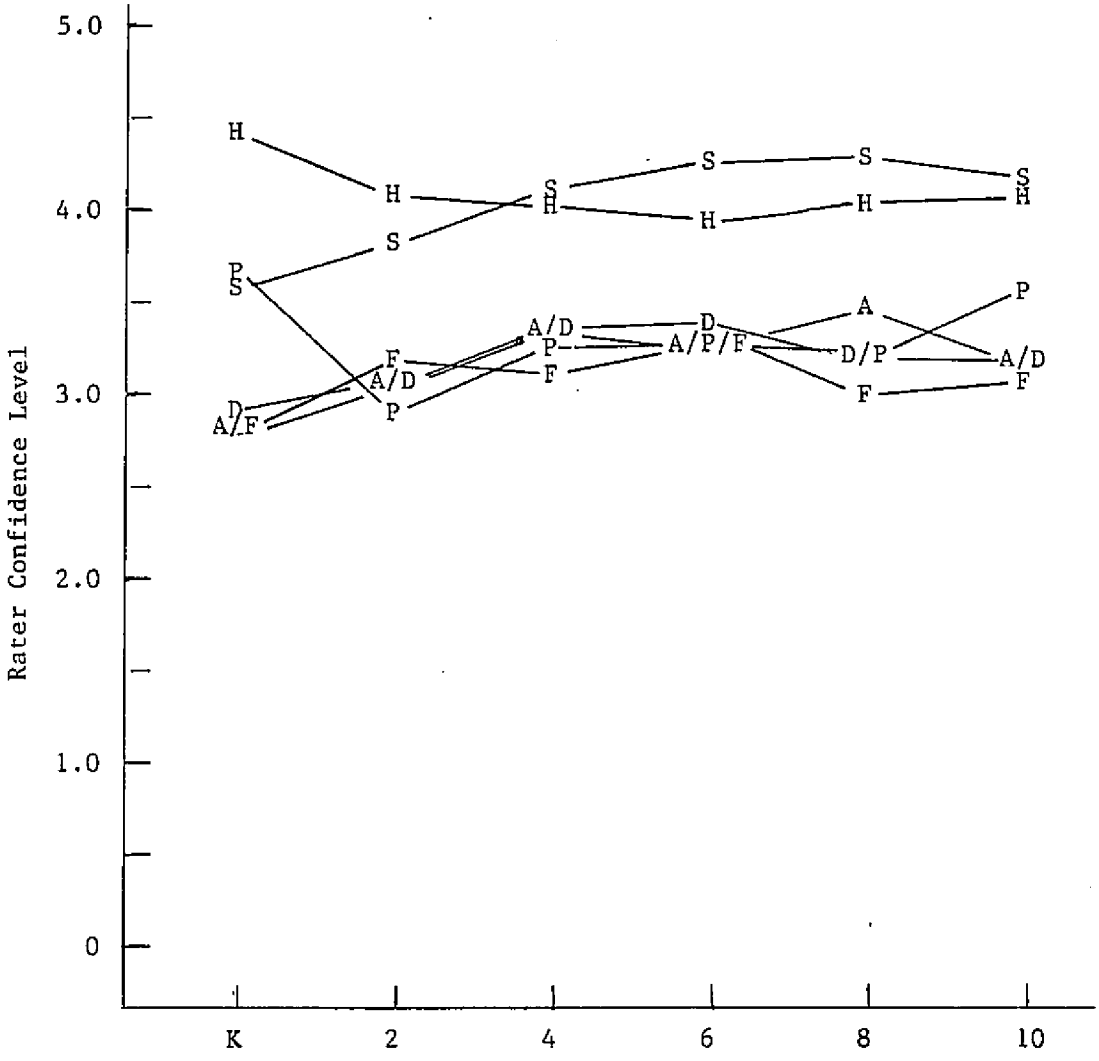
Distribution of Rater Accuracy Group Mean Scores
for Child Age and Affective Condition



H = Happy D = Disgust
S = Sad P = Surprise
A = Anger F = Fear

Figure 2

Distribution of Rater Confidence Group Mean Scores
for Child Age and Affective Condition



cognition rates associated with Child Sex are reported in frequency tables (21, 24, 25, 28) and ANOVA tables (9-20).

No significant difference was obtained between female and male children for the total frequency of affective expressions correctly identified by the raters. Four drawings separated the sum accuracy scores for the child sexes (2242 for females; 2238 for males), representing a .1% recognition rate difference. Significant Child Sex differences were obobtained for the ANOVAs for the affective conditions. The Child Sex means are reported in Table 32. As seen in Tables 21 and 32, Sadness and Surprise were correctly identified significantly more frequently in the girls' drawings, while Anger and Fear were correctly identified more frequently in the boys' drawings. There were no significant Child Sex differences for the recognition of Happiness and Disgust.

Significant Child Sex differences were obtained from the ANOVAs for confidence ratings, and with one exception, the results were consistent with those from the rater accuracy data. As indicated in Table 32, significantly higher confidence ratings were assigned to the girls' drawings of Sadness, Surprise, and Happiness; higher confidence ratings were assigned to the boys' drawings of Fear and Anger. No significant Child Sex differences were obtained for Disgust.

Rater Sex:

The effects of the sex of the adult rater on the rater accuracy and rater confidence data were assessed through a

series of presentations of descriptive data (Tables 22, 25, 26, and 29), and repeated measures ANOVAs (Tables 9-14 and 15-20). As can be seen, no significant differences between sexes were obtained from any of these analyses. Of the 4480 correctly identified affective expressions, 2231 were identified by female raters and 2249 were identified by male raters which represents a .4% accuracy rate difference.

Rater Group:

The capabilities of differentially trained and exoerienced raters to identify the children's affective expressions were addressed through a series of descriptive presentations (Tables 23, 27, 28, and 29), and the repeated measures ANOVAs for rater accuracy data (Tables 9-14) and for rater confidence data (Tables 15-20). As indicated in Table 23, Graduate Students attained the highest mean accuracy rate (60.5% unadjusted; 43.1% adjusted) followed by Child Psychologists (57.6% unadjusted; 40.4% adjusted) and Non-Mental Health raters (54.9% unadjusted, 38.0% adjusted). The Child Psychologists' mean performance closely approximated the mean performance for the raters' combined performance.

As can be seen in Tables 16, 18, and 23, significant differences were obtained between rater grouos for the affective conditions of Sadness and Disgust. The order of accuracy rates from highest to lowest for both affective

expressions was Graduate Students, Child Psychologists, and Non-Mental Health Raters, a pattern consistent with the total frequency differences. The group means from the repeated measures ANOVAs for rater accuracy scores are presented in Table 33. The results of the repeated measures ANOVAs for the rater confidence scores are reported in Tables 15-20; the group means for confidence ratings are presented in Table 33. As can be seen, significant differences between groups were obtained for all affective expressions, with the exception of Happiness. The order of confidence ratings from least to greatest for the six affective expressions was Graduate Students, Child Psychologists, and Non-Mental Health raters. Thus, an inverse relationship occurred between confidence ratings and accuracy ratings for many affective expressions, such that the most accurate rater group reported the lowest confidence ratings and the least accurate rater group reported the highest confidence ratings. For example, although the Graduate Students correctly identified a larger number of Sad drawings than the other two groups, the Graduate Students reported lower confidence in their decisions than the Child Psychologists and Non-Mental Health Raters.

Interactions:

The final group of comparisons reported are the interactions between the variables as they affected rater accuracy and rater confidence data. Again, the results of the

repeated measures ANOVAs are reported in Tables 9-14 for rater accuracy data and Tables 15-20 for rater confidence data; the descriptive data are presented in Tables 21-29.

As indicated in Table 24, .1 percentage point differentiated the total frequency data for the interaction of Child Sex X Child Age. However, significant Child Sex X Child Age interactions were obtained for all six affective expressions for the repeated measures ANOVA rater accuracy and rater confidence data. The distribution of the rater accuracy cell means is displayed in Figure 3; the distribution of cell means for rater confidence data is displayed in Figure 4. Although the patterns of distributions by affective condition were similar for rater accuracy and rater confidence data, no consistent pattern is apparent for the distribution of data across affective conditions.

The data obtained from a significant Rater Sex X Child Sex interaction for rater accuracy of Fear is displayed in Figure 5. As can be seen, the female and male raters less accurately identified female than male drawings. The most notable Rater Sex difference was the relatively lower accuracy of recognition rates for girls' drawings by the male raters.

Significant Rater Group X Child Sex interactions were obtained for the Sadness and Surprise confidence ratings. The distribution of these means is reported in Figure 6. The distribution of cell means for the significant Child

Figure 3

Accuracy of Recognition Rates by Affective Expression: Age X Child Sex Differences

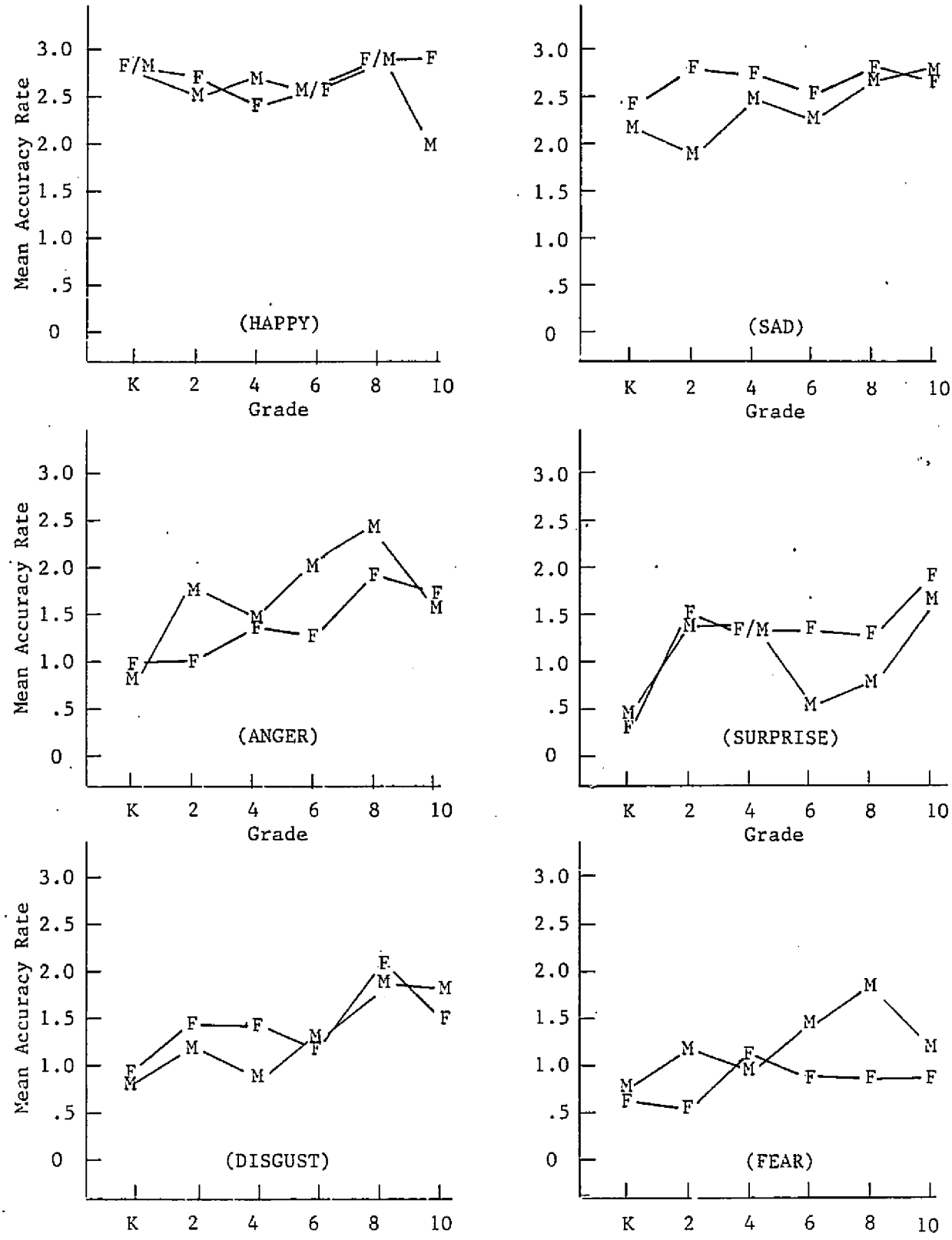


Figure 4

Distribution of Significant Child Age X Child Sex Interactions: Rater Confidence Data

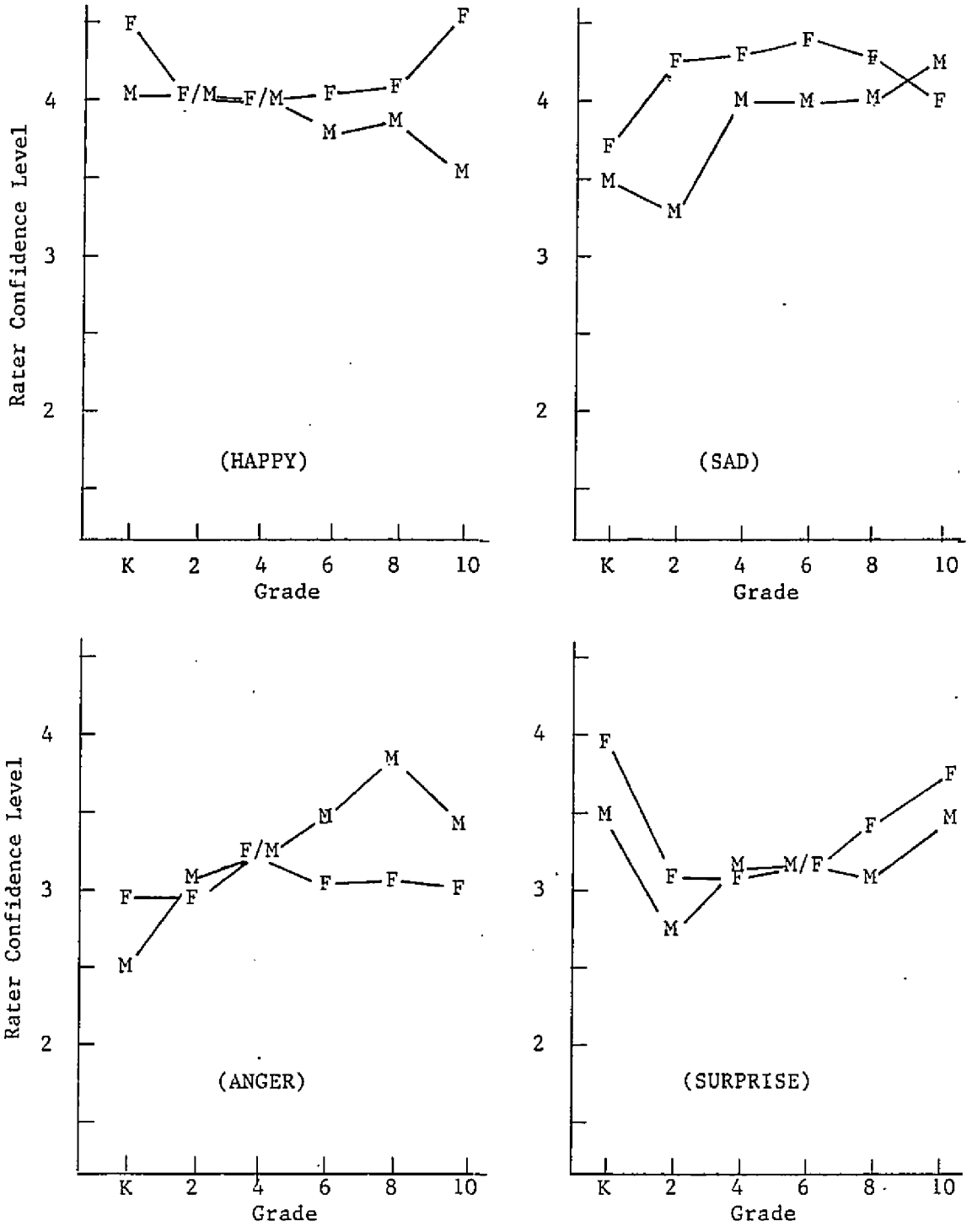


Figure 5

Distribution of Significant Rater Sex X Child Sex Interaction for Fear: Rater Accuracy Data

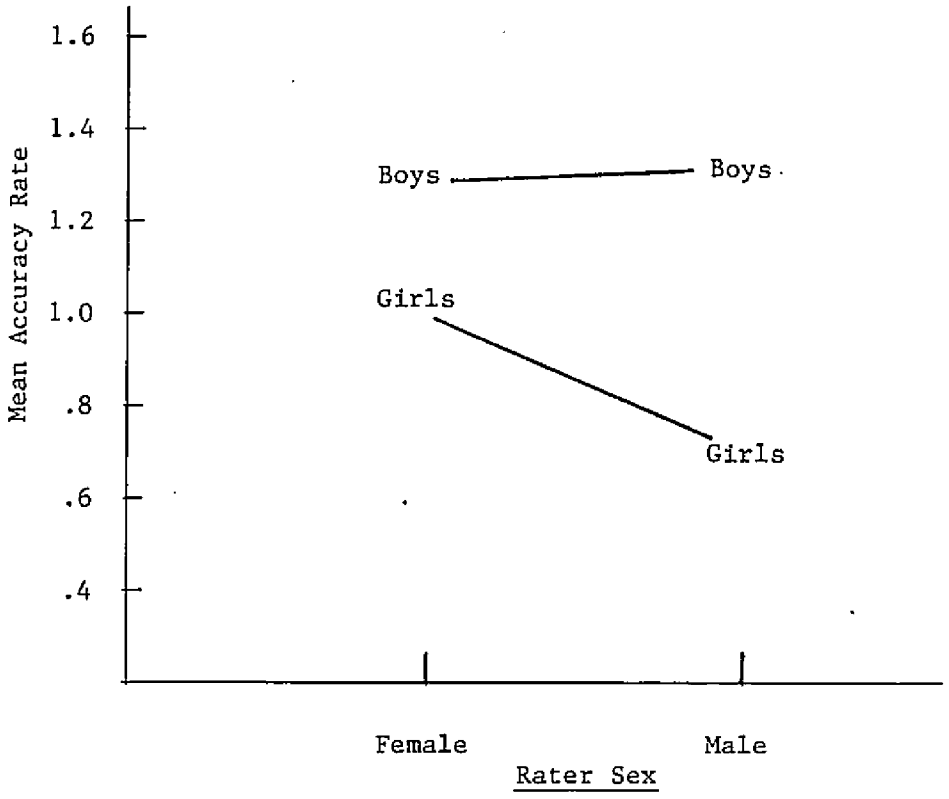
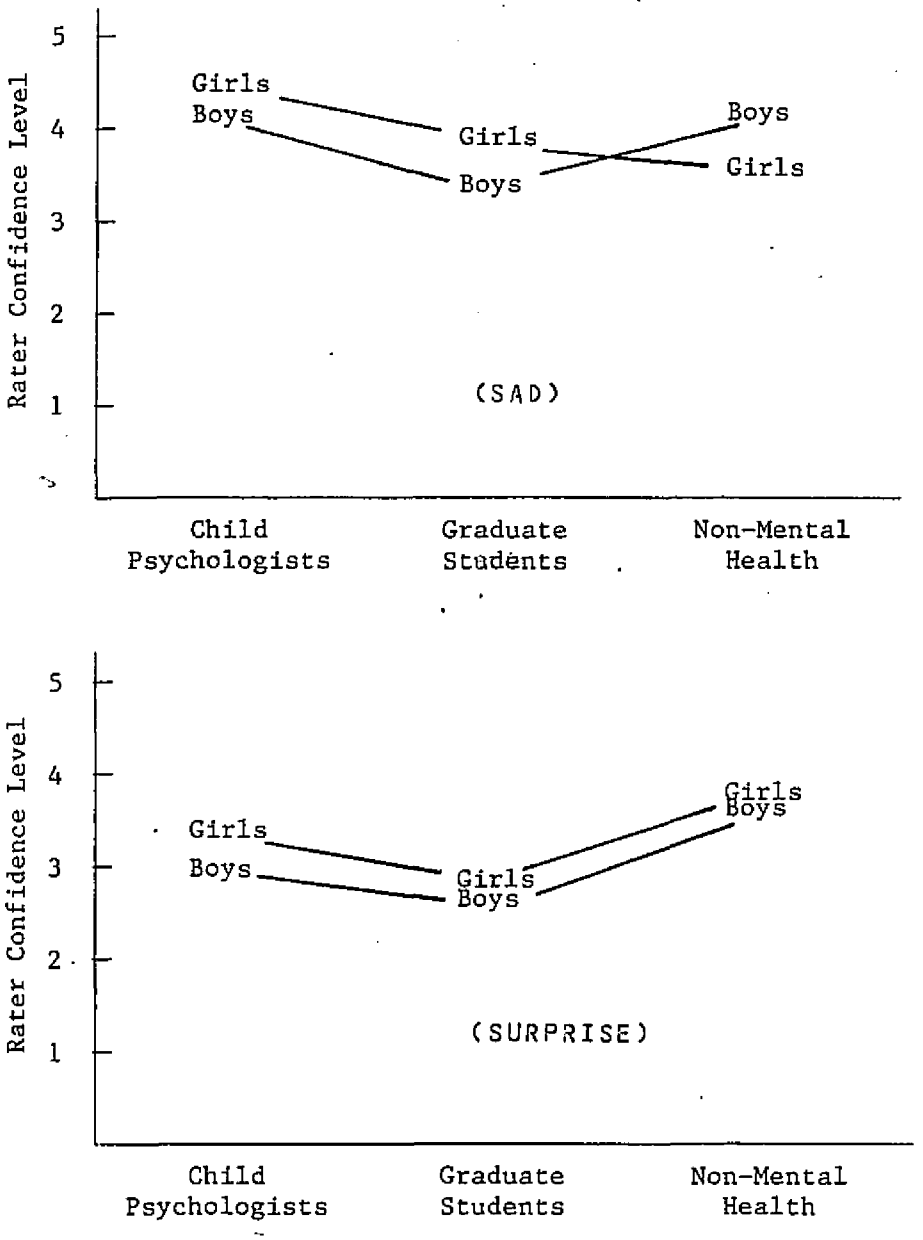


Figure 6

Distribution of Significant Rater Group X
Child Sex Interactions: Rater Confidence Data



Age X Child Sex X Rater Sex interaction for the Sadness accuracy data is displayed in Figure 7. No other interactions were significant.

Figure 7

Significant Child Age X Child Sex X
Rater Sex Interaction for Sadness:
Rater Accuracy Data

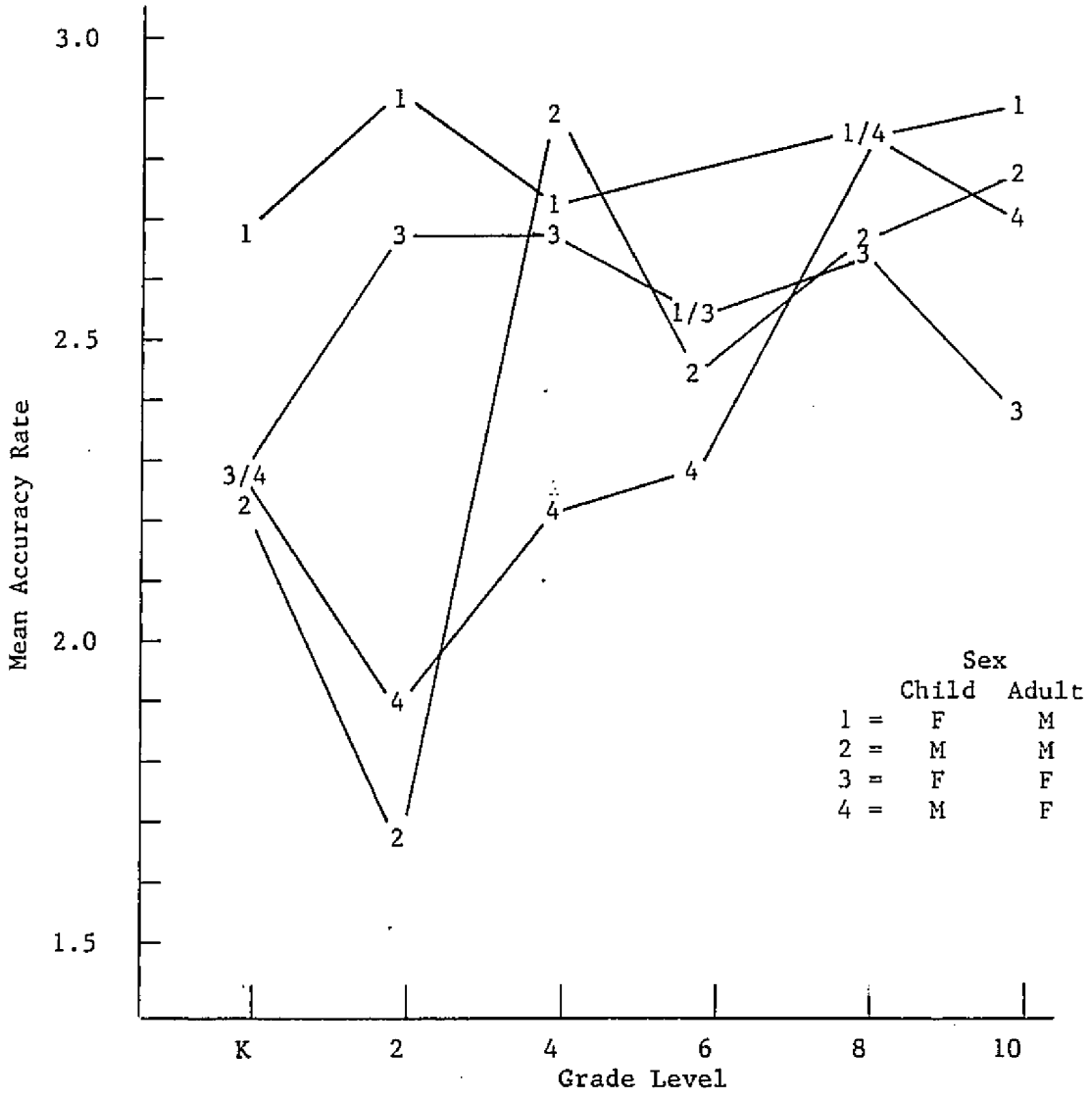


Table 8

Grade X Affective Expression:
Percent Correctly Identified and Percent
Adjusted to Include Commission Errors
(Total n= 7770; adjusted n= 11062)

Affective Expression	Grade K	2	4	6	8	10	Total (frequency)
Happiness	94.9	90.7	84.7	84.7	93.5	82.9	88.8
(Adjusted)	40.4	58.9	71.5	68.9	79.8	62.2	60.3 (1150)
Sadness	79.6	75.5	87.9	81.5	88.9	89.8	84.0
(Adjusted)	53.3	54.5	61.3	60.9	72.5	79.5	62.8 (1089)
Anger	27.3	46.3	49.1	58.8	75.0	59.3	52.7
(Adjusted)	21.5	33.9	35.4	41.6	52.3	44.3	38.4 (683)
Disgust	25.9	44.4	37.5	42.8	67.7	56.9	46.1
(Adjusted)	20.4	35.3	30.1	30.4	51.6	44.7	35.3 (597)
Surprise	14.5	49.5	43.9	31.0	33.8	64.8	39.6
(Adjusted)	9.7	33.5	29.7	20.7	25.0	42.2	26.9 (512)
Fear	20.0	29.2	35.2	41.7	45.4	35.6	34.7
(Adjusted)	14.1	18.4	19.7	25.9	31.2	23.7	21.9 (447)
Total:							
Unadjusted	43.8	55.9	56.7	56.8	67.2	64.9	57.1
(Adjusted)	28.1	38.9	39.8	40.0	50.6	47.9	40.5
Frequency	566	725	735	743	870	841	(4480)

Table 9

Repeated Measures Analysis of Variance:

Recognition Rates for Happy

Source	SS	df	MS	F	p
Between Subjects					
Rater Group	1.129	2	.565	.51	NS
Rater Sex (RSex)	3.343	1	3.343	3.04	NS
Group X RSex	1.796	2	.898	.82	NS
Error	33.000	30	1.100		
Within Subjects					
Child Age (CAge)	4.657	5	.931	2.31	< .05
CAge X Group	3.481	10	.348	.86	NS
CAge X RSex	.657	5	.131	.33	NS
CAge X Group X RSex	3.537	10	.354	.88	NS
Error	60.500	150	.403		
Child Sex (CSex)	.926	1	.926	2.65	NS
CSex X Group	.519	2	.259	.74	NS
CSex X Rsex	0	1	0	0	NS
CSex X Group X RSex	.222	2	.111	.32	NS
Error	10.500	30	.350		
CAge X CSex	11.907	5	2.381	8.86	< .001
CAge X CSex X Group	1.648	10	.165	.61	NS
CAge X CSex X RSex	.278	5	.056	.21	NS
CAge X CSex X Group X RSex	2.667	10	.267	.99	NS
Error	40.333	150	.269		

Table 10

Repeated Measures Analysis of Variance:

Recognition Rates for Sadness

Source	SS	df	MS	F	p
Between Subjects					
Rater Group	6.681	1	3.340	3.62	< .05
Rater Sex (RSex)	2.836	2	2.836	3.07	NS
Group X RSex	8.366	2	4.183	4.53	< .05
Error	27.861	30	.923		
Within Subjects					
Child Age (CAge)	11.854	5	2.371	6.87	< .001
CAge X Group	4.069	10	.407	1.18	NS
CAge X RSex	1.650	5	.330	.96	NS
CAge X Group X RSex	2.439	10	.244	.71	NS
Error	51.736	150	.345		
Child Sex (CSex)	7.002	1	7.002	16.71	< .001
CSex X Group	.338	2	.169	.40	NS
CSex X RSex	.391	1	.391	.93	NS
CSex X Group X RSex	.782	2	.391	.93	NS
Error	12.569	30	.419		
CAge X CSex	13.262	5	2.652	9.36	< .001
CAge X CSex X Group	2.523	10	.252	.89	NS
CAge X CSex X RSex	4.206	5	.841	2.97	< .05
CAge X CSex X Group X RSex	.912	10	.091	.32	NS
Error	42.514	150	.283		

Table 11

Repeated Measures Analysis of Variance:
Recognition Rates for Anger

Source	SS	df	MS	F	p
Between Subjects					
Rater Group	4.310	2	2.155	1.78	NS
Rater Sex (RSex)	0	1	0	0	NS
Group X RSex	.431	2	.215	.18	NS
Error	36.389	30	1.213		
Within Subjects					
Child Age (CAge)	81.019	5	16.204	22.98	< .001
CAge X Group	3.134	10	.313	.44	NS
CAge X RSex	4.500	5	.900	1.28	NS
CAge X Group X RSex	4.069	10	.407	.58	NS
Error	105.778	150	.705		
Child Sex (CSex)	10.083	1	10.083	11.91	< .01
CSex X Group	3.014	2	1.507	1.78	NS
CSex X RSex	.750	1	.750	.89	NS
CSex X Group X RSex	2.931	2	1.465	1.73	NS
Error	25.389	30	.846		
CAge X CSex	15.472	5	3.094	5.92	< .001
CAge X CSex X Group	2.931	10	.293	.56	NS
CAge X CSex X RSex	1.139	5	.228	.44	NS
CAge X CSex X Group X RSex	5.847	10	.585	1.12	NS
Error	78.444	150	.523		

Table 12

Repeated Measures Analysis of Variance:

Recognition Rates for Disgust

Source	SS	df	MS	F	p
Between Subjects					
Rater Group	11.375	2	5.688	6.36	< .01
Rater Sex (RSex)	.280	1	.280	.31	NS
Group X RSex	1.894	2	.947	1.06	NS
Error	26.847	30	.895		
Within Subjects					
Child Age (CAge)	64.826	5	12.965	17.41	< .001
CAge X Group	14.153	10	1.415	1.90	< .05
CAge X RSex	2.567	5	.513	.69	NS
CAge X Group X RSex	2.801	10	.280	.38	NS
Error	111.736	150	.745		
Child Sex (CSex)	1.021	1	1.021	1.36	NS
CSex X Group	1.847	2	.924	1.23	NS
CSex X RSex	.021	1	.021	.03	NS
CSex X Group X RSex	.347	2	.174	.23	NS
Error	22.514	30	.750		
CAge X CSex	8.771	5	1.754	3.13	< .05
CAge X CSex X Group	4.903	10	.490	.87	NS
CAge X CSex X RSex	1.104	5	.221	.39	NS
CAge X CSex X Group X RSex	2.903	10	.290	.52	NS
Error	34.069	150	.560		

Table 13

Repeated Measures Analysis of Variance:

Recognition Rates for Surprise

Source	SS	df	MS	F	p
Between Subjects					
Rater Group	3.655	2	1.828	1.74	NS
Rater Sex (RSex)	.016	1	.016	.02	NS
Group X RSex	.043	2	.022	.02	NS
Error	31.459	30	1.049		
Within Subjects					
Child Age (CAge)	90.244	5	18.049	25.97	< .001
CAge X Group	5.010	10	.501	.72	NS
CAge X RSex	1.331	5	.266	.38	NS
CAge X Group X RSex	5.582	10	.558	.80	NS
Error	104.231	150	.695		
Child Sex (CSex)	5.133	1	5.133	7.98	< .01
CSex X Group	.081	2	.041	.06	NS
CSex X RSex	.079	1	.079	.12	NS
CSex X Group X RSex	.012	2	.006	.01	NS
Error	19.302	30	.643		
CAge x CSex	9.500	5	1.900	3.88	< .01
CAge X CSex X Group	3.515	10	.352	.72	NS
CAge X CSex X RSex	1.842	5	.368	.75	NS
CAge X CSex X Group X RSex	6.766	10	.677	1.33	NS
Error	73.379	150	.489		

Table 14

Repeated Measures Analysis of Variance:

Recognition Rates for Fear

Source	SS	df	MS	F	p
Between Subjects					
Rater Group	1.102	2	.551	.58	NS
Rater Sex (RSex)	1.884	1	1.884	1.97	NS
Group X Rsex	2.352	2	1.176	1.23	NS
Error	28.736	30	.958		
Within Subjects					
Child Age (CAge)	19.319	5	3.864	6.81	< .001
CAge X Group	8.223	10	.822	1.45	NS
CAge X RSex	1.277	5	.255	.45	NS
CAge X Group X RSex	4.233	10	.423	.75	NS
Error	85.114	150	.567		
Child Sex (CSex)	16.337	1	16.338	26.39	< .001
CSex X Group	.692	2	.346	.56	NS
CSex X RSex	4.219	2	4.219	6.82	< .01
CSex X Group X RSex	.136	2	.068	.11	NS
Error	18.558	30	.619		
CAge X CSex	14.369	5	2.874	5.22	< .001
CAge X CSex X Group	6.743	10	.674	1.22	NS
CAge X CSex X RSex	3.961	5	.792	1.44	NS
CAge X CSex X Group X RSex	6.090	10	.609	1.11	NS
Error	82.692	150	.551		

Table 15

Repeated Measures Analysis of Variance:
Confidence Ratings for Happy

Source	SS	df	MS	F	p
Between Subjects					
Rater Group	26.002	2	3.011	2.73	NS
Rater Sex (RSex)	.037	1	.037	.01	NS
Group X RSex	9.177	2	4.589	.96	NS
Error	143.201	30	4.773		
Within Subjects					
Child Age (CAge)	6.061	5	1.212	5.20	< .001
CAge X Group	1.873	10	.187	.80	NS
CAge X RSex	.642	5	.128	.55	NS
CAge X Group X RSex	2.366	10	.237	1.01	NS
Error	34.966	150	.233		
Child Sex (CSex)	12.000	1	12.000	73.04	< .001
CSex X Group	.946	2	.473	2.88	NS
CSex X RSex	.083	1	.083	.51	NS
CSex X Group X RSex	.875	2	.438	2.66	NS
Error	4.929	30	.164		
CAge X CSex	10.765	5	2.153	9.79	< .001
CAge X CSex X Group	1.807	10	.181	.82	NS
CAge X CSex X RSex	.559	5	.112	.51	NS
CAge X CSex X Group X RSex	2.390	10	.239	1.09	NS
Error	32.978	150	.219		

Table 16

Repeated Measures Analysis of Variance:

Confidence Ratings for Sadness

Source	SS	df	MS	F	p
Between Subjects					
Rater Group	24.892	2	12.446	3.70	< .05
Rater Sex (RSex)	.013	1	.013	.00	NS
Group X RSex	13.446	2	6.724	2.00	NS
Error	100.939	30	3.365		
Within Subjects					
Child Age (CAge)	29.362	5	5.872	24.04	< .001
CAge X Group	3.441	10	.344	1.41	NS
CAge X RSex	1.387	5	.277	1.41	NS
CAge X Group X RSex	2.527	10	.253	1.03	NS
Error	36.644	150	.244		
Child Sex (CSex)	9.982	1	9.982	46.81	< .001
CSex X Group	1.534	2	.767	3.60	< .05
CSex X RSex	.188	1	.188	.88	NS
CSex X Group X RSex	.002	2	.001	.00	NS
Error	6.397	30	.213		
CAge X CSex	13.757	5	2.751	9.02	< .001
CAge X CSex X Group	2.842	10	.284	.93	NS
CAge X CSex X RSex	1.409	5	.282	.92	NS
CAge X CSex X Group X RSex	4.609	10	.461	1.51	NS
Error	45.779	150	.305		

Table 17

Repeated Measures Analysis of Variance:
Confidence Ratings for Anger

Source	SS	df	MS	F	p
Between Subjects					
Rater Group	70.673	2	35.336	7.28	< .01
Rater Sex (RSex)	.544	1	.544	.11	NS
Group X RSex	8.409	2	4.205	.87	NS
Error	145.531	30	4.851		
Within Subjects					
Child Age (CAge)	24.225	5	4.845	15.05	< .001
CAge X Group	3.648	10	.365	1.13	NS
CAge X Rsex	3.493	5	.699	2.17	NS
CAge X Group X RSex	2.831	10	.283	.88	NS
Error	48.302	150	.322		
Child Sex (CSex)	4.898	1	4.898	12.48	< .01
CSex X Group	.963	2	.481	1.23	NS
CSex X RSex	.174	1	.174	.44	NS
CSex X Group X RSex	.502	2	.251	.64	NS
Error	11.778	30	.393		
CAge X CSex	14.256	5	2.851	8.76	< .001
CAge X CSex X Group	2.919	10	.292	.90	NS
CAge X CSex X RSex	2.808	5	.562	1.73	NS
CAge X CSex X Group X RSex	1.461	10	.146	.45	NS
Error	48.796	150	.325		

Table 18

Repeated Measures Analysis of Variance:

Confidence Ratings for Disgust

Source	SS	df	MS	F	p
Between Subjects					
Rater Group	50.932	2	25.466	7.68	< .01
Rater Sex (RSex)	.925	1	.926	.28	NS
Group X RSex	10.006	2	5.003	1.51	NS
Error	99.441	20	3.315		
Within Subjects					
Child Age (CAge)	15.379	5	3.076	6.49	< .001
CAge x Group	7.577	10	.758	1.60	NS
CAge X RSex	4.716	5	.943	1.99	NS
CAge X Group X RSex	5.843	10	.584	1.23	NS
Error	71.096	150	.474		
Child Sex (CSex)	.231	1	.231	.87	NS
CSex X Group	.469	2	.235	.88	NS
CSex X RSex	.037	1	.037	.14	NS
CSex X Group X RSex	.228	2	.114	.43	NS
Error	7.978	30	.266		
CAge X CSex	6.682	5	1.336	3.14	< .05
CAge X CSex X Group	2.256	10	.226	.53	NS
CAge X CSex X RSex	1.401	5	.280	.66	NS
CAge X CSex X Group X RSex	2.343	10	.234	.55	NS
Error	63.929	150	.426		

Table 19

Repeated Measures Analysis of Variance:
Confidence Ratings for Surprise

Source	SS	df	MS	F	p
Between Subjects					
Rater Group	68.650	2	34.325	8.48	< .01
Rater Sex (RSex)	10.659	1	10.659	2.63	NS
Group X RSex	4.013	2	2.007	.50	NS
Error	121.388	30	4.046		
Within Subjects					
Child Age (CAge)	30.068	5	6.014	19.67	< .001
CAge X Group	3.425	10	.343	1.12	NS
CAge X RSex	.754	5	.151	.49	NS
CAge X Group X RSex	2.853	10	.285	.93	NS
Error	45.858	150	.306		
Child Sex (CSex)	4.838	1	4.838	24.93	< .001
CSex X Group	1.669	2	.834	4.30	< .05
CSex X RSex	.004	1	.004	.02	NS
CSex X Group X RSex	.625	2	.312	1.61	NS
Error	5.821	30	.194		
CAge X CSex	5.445	5	1.089	2.93	< .05
CAge X CSex X Group	4.067	10	.407	1.10	NS
CAge X CSex X RSex	1.509	5	.302	.81	NS
CAge X CSex X Group X RSex	2.152	10	.215	.53	NS
Error	55.653	150	.371		

Table 20

Repeated Measures Analysis Of Variance:

Confidence Ratings for Fear

Source	SS	df	MS	F	df
Between Subjects					
Rater Group	77.835	2	38.917	6.86	< .01
Rater Sex (RSex)	4.827	1	4.827	.85	NS
Group X RSex	5.744	2	2.872	.51	NS
Error	170.137	30	5.671		
Within Subjects					
Child Age (CAge)	9.799	5	1.959	5.83	< .001
CAge X Group	4.026	10	.403	1.20	NS
CAge X RSex	1.128	5	.226	.67	NS
CAge X Group X RSex	1.592	10	.159	.47	NS
Error	50.446	150	.336		
Child Sex (CSex)	2.225	1	2.225	4.84	< .05
CSex X Group	.742	2	.371	.81	NS
CSex X RSex	.216	1	.216	.47	NS
CSex X Group X RSex	.399	2	.199	.43	NS
Error	13.779	30	.459		
CAge X CSex	4.478	5	.896	2.46	< .05
CAge X CSex X Group	1.792	10	.179	.49	NS
CAge X CSex X RSex	2.097	5	.419	1.15	NS
CAge X CSex X Group X RSex	1.672	10	.167	.46	NS
Error	54.545	150	.364		

Table 21

Child Sex X Affective Expression: Percent Correctly Identified and Percent Adjusted to Include Commission Errors. (Total n= 7770; adjusted n= 11062).

Affective Expression	Child Sex: Female	Child Sex: Male	Total (frequency)
Happiness	90.6	87.0	88.8
(Adjusted)	61.5	58.8	60.3
			(1150)
Sadness	89.0	79.0	84.0
(Adjusted)	63.8	61.7	62.8
			(1089)
Anger	48.1	57.3	52.7
(Adjusted)	35.7	41.1	38.4
			(683)
Disgust	47.5	44.7	46.1
(Adjusted)	36.6	34.1	35.3
			(597)
Surprise	43.2	35.9	39.6
(Adjusted)	30.2	23.7	26.9
			(512)
Fear	27.7	41.7	34.7
(Adjusted)	17.2	26.8	22.9
			(447)
Total:			
Unadjusted	57.7	57.6	57.7
(Adjusted)	40.5	40.6	40.5
Frequency	2242	2238	(4480)

Table 22

Rater Sex X Affective Expression:
Percent Correctly Identified and Percent
Adjusted to Include Commission Errors
(Total n= 7770; adjusted n= 11062)

Affective Expression	Rater's Sex: Female	Male	Total (frequency)
Happiness	85.2	92.4	88.8
(Adjusted)	60.2	60.5	60.3
			(1150)
Sadness	82.3	85.8	84.0
(Adjusted)	61.5	63.9	62.8
			(1089)
Anger	52.9	52.5	52.7
(Adjusted)	39.2	37.7	38.4
			(683)
Disgust	47.1	45.1	46.1
(Adjusted)	35.3	35.3	35.3
			(597)
Surprise	40.1	39.0	39.6
(Adjusted)	26.9	26.8	26.9
			(512)
Fear	36.9	32.5	34.7
(Adjusted)	22.7	21.1	22.9
			(449)
Total:			
Unadjusted	57.4	57.9	57.7
(Adjusted)	40.3	40.4	40.5
Frequency	2231	2249	(4480)

Table 23

Rater Group X Affective Expression:
Percent Correctly Identified and Percent
Adjusted to Include Commission Errors.
(Total n= 7770; adjusted n= 11062)

Affective Expression	Adult Group: Child Psychologist	Graduate Student	Non-Mental Health	Total (frequency)
Happiness	88.2	87.7	90.5	88.8
(Adjusted)	62.7	60.5	58.0	60.3
				(1150)
Sadness	85.2	88.2	78.7	84.0
(Adjusted)	65.1	66.4	57.1	62.8
				(1089)
Anger	55.8	54.6	47.7	52.7
(Adjusted)	39.5	41.3	34.6	38.4
				(683)
Disgust	45.4	53.0	39.9	46.1
(Adjusted)	35.4	41.2	29.6	35.3
				(597)
Surprise	33.9	43.5	41.2	39.6
(Adjusted)	23.4	28.5	28.7	26.9
				(512)
Fear	36.7	35.9	31.6	34.7
(Adjusted)	21.7	23.9	20.2	22.9
				(449)
Total:				
Unadjusted	57.6	60.5	54.9	57.7
(Adjusted)	40.4	43.1	38.0	40.5
Frequency	1490	1568	1422	(4480)

Table 24

Child Sex X Grade:
Percent Correctly Identified and Percent
Adjusted to Include Commission Errors.
(Total n= 7770; adjusted n= 11062)

Grade	Child Sex: Female	Male	Total (frequency)
K	44.0	43.5	43.8
(Adjusted)	28.5	27.8	28.1
			(566)
2	56.9	55.0	55.9
(Adjusted)	39.5	38.5	38.9
			(725)
4	59.3	54.2	56.7
(Adjusted)	41.9	37.2	39.8
			(735)
6	55.1	59.7	57.4
(Adjusted)	38.3	41.7	40.0
			(743)
8	65.2	69.1	67.2
(Adjusted)	48.2	53.0	50.6
			(870)
10	65.1	64.7	64.9
(Adjusted)	48.2	47.7	47.9
			(841)
Total:			
Unadjusted	57.7	57.6	57.7
(Adjusted)	40.5	40.6	40.5
Frequency	2242	2238	(4480)

Table 25

Rater Sex X Child Sex:
Percent Correctly Identified and Percent
Adjusted to Include Commission Errors
(Total n= 7770; adjusted n= 11062)

Child Sex	Rater Sex: Female	Rater Sex: Male	Total (frequency)
Female	57.7	57.7	57.7
(Adjusted)	40.5	40.4	40.4
			(2242)
Male	57.1	58.1	57.6
(Adjusted)	40.0	41.1	40.6
			(2238)
Total:			
Unadjusted	57.4	57.9	57.7
(Adjusted)	40.3	40.7	40.5
Frequency	2231	2249	(4480)

Table 26

Rater Sex X Grade:
Percent correctly identified and percent adjusted to include comission errors.
(Total n= 7770; adjusted n= 11062)

Grade	Rater's Sex: Female	Male	Total (frequency)
K	43.4	44.2	43.8
(Adjusted)	27.9	28.4	28.1
			(566)
2	54.9	57.1	55.9
(Adjusted)	38.0	39.9	38.9
			(725)
4	56.6	57.1	56.7
(Adjusted)	38.9	40.1	39.8
			(735)
6	58.1	56.6	57.4
(Adjusted)	39.4	39.7	40.0
			(743)
8	67.2	67.1	67.2
(Adjusted)	50.6	50.6	50.6
			(870)
10	64.7	65.1	64.9
(Adjusted)	47.1	48.5	47.9
			(841)
Total:			
Unadjusted	57.4	57.9	57.7
(Adjusted)	40.2	40.4	40.5
Frequency	2231	2249	(4480)

Table 27

Rater Group X Grade:
Percent Correctly Identified and Percent
Adjusted to Include Commision Errors
(Total n= 7770; adjusted n= 11062)

Grade	Adult Group: Child Psychologist	Graduate Student	Non-Mental Health	Total (frequency)
K	44.5	46.1	40.7	43.8
(Adjusted	29.1	29.3	26.2	28.1
				(566)
2	56.9	59.0	51.9	55.9
(Adjusted)	39.1	41.8	35.7	38.9
				(725)
4	55.8	57.4	56.9	56.7
(Adjusted)	38.7	40.2	39.7	39.8
				(735)
6	58.3	58.8	54.9	57.4
(Adjusted)	41.6	41.2	37.3	40.0
				(743)
8	66.9	72.5	62.2	67.2
(Adjusted)	50.1	57.2	44.9	50.6
				(870)
10	62.7	69.2	62.7	64.9
(Adjusted)	45.5	52.9	45.7	47.9
				(841)
Total:				
Unadjusted	57.6	60.5	54.9	57.7
(Adjusted)	40.4	43.1	38.0	40.5
Frequency	1490	1568	1422	(4480)

Table 28

Rater Group X Child Sex:
Percent correctly identified and percent adjusted to include comission errors
(Total n= 7770; adjusted n= 11062)

Rater Group	Child Sex: Female	Male	Total (frequency)
Child Psychologist	56.9	58.1	57.6
(Adjusted)	39.8	40.9	40.4
			(1490)
Graduate Student	60.8	60.2	60.5
(Adjusted)	43.3	42.8	43.1
			(1568)
Non-Mental Health	55.4	54.5	54.9
(Adjusted)	38.3	37.8	38.0
			(1422)
Total:			
Unadjusted	57.7	57.6	57.7
(Adjusted)	40.5	40.6	40.5
Frequency	2242	2238	(4480)

Table 29

Rater Group X Rater Sex:
Percent Correctly Identified and Percent
Adjusted to Include Commission Errors.
(Total n= 7770; adjusted n= 11062).

Rater Group	Rater Sex: Female	Male	Total (frequency)
Child Psychologist	59.7	55.4	57.6
(Adjusted)	42.5	38.3	40.4
			(1490)
Graduate Student	59.5	61.5	60.5
(Adjusted)	41.9	44.4	43.1
			(1568)
Non-Mental Health	53.1	56.7	54.9
(Adjusted)	36.5	39.6	38.0
			(1422)
Total:			
Unadjusted	57.4	57.9	57.7
(Adjusted)	40.2	40.4	40.5
Frequency	2231	2249	(4480)

Table 30

Mean Accuracy of Recognition Rates by Affective Expression and Child Age: From Repeated Measures Analyses of Variance

Affective Expression	Grade K	2	4	6	8	10
Happiness	2.76	2.64	2.58	2.59	2.79	2.50
Sadness	2.36	2.28	2.63	2.46	2.71	2.69
Anger	.83	1.40	1.46	1.76	2.26	1.72
Disgust	.82	1.35	1.13	1.28	2.01	1.71
Surprise	.43	1.43	1.28	.93	1.06	1.92
Fear	.67	.92	1.11	1.21	1.36	1.09

Table 31

Mean Confidence Ratings by Affective Expression and Child Age: From Repeated Measures Analyses of Variance

Affective Expression	Grade K	2	4	6	8	10
Happiness	4.36	4.12	4.07	3.96	4.09	4.12
Sadness	3.62	3.75	4.18	4.26	4.27	4.21
Anger	2.76	3.04	3.31	3.31	3.52	3.20
Disgust	2.83	3.08	3.33	3.37	3.32	3.15
Surprise	3.71	2.92	3.24	3.26	3.26	3.61
Fear	2.79	3.16	3.10	3.30	3.09	3.09

Table 32

Child Sex Means by Affective Expression: From Repeated Measures Analyses of Variance for Rater Accuracy and Rater Confidence

Affective Expression	Accuracy Ratings		Confidence Ratings	
	Female	Male	Female	Male
Happiness	2.689	2.597	4.286	3.952 **
Sadness	2.648	2.394 **	4.199	3.895 **
Anger	1.421	1.727 **	3.208	3.296 **
Disgust	1.431	1.333	3.157	3.204
Surprise	1.282	1.065 **	3.439	3.390 **
Fear	.867	1.257 **	3.019	3.162 *

** $p < .01$
* $p < .05$

Table 33

Rater Group Accuracy Means by Affective Condition: From Repeated Measures ANOVAs for Rater Accuracy and Rater Confidence Data

Affective Expression	Rater Group: Child Psychologist	Graduate Student	Non-Mental Health	
Rater Accuracy Data:				
Happiness	2.639	2.583	2.708	
Sadness	2.556	2.653	2.354	*
Anger	1.090	1.097	.936	
Disgust	1.361	1.590	1.194	**
Surprise	1.053	1.258	1.229	
Fear	1.574	1.611	1.437	
Rater Confidence Data:				
Happiness	4.012	3.886	4.458	
Sadness	4.162	3.713	4.266	*
Anger	3.189	2.694	3.685	**
Disgust	3.139	2.782	3.620	**
Surprise	3.250	2.842	3.833	**
Fear	3.106	2.563	3.602	**

Higher scores indicate greater accuracy or confidence.

* $p < .05$
** $p < .01$

Discussion

This study represented the first attempt to directly assess the abilities of adults to identify common affective expressions graphically depicted by children in a clinically relevant task, i.e. children's drawings of the human figure. The primary objectives were to determine descriptive baserate information on a number of seemingly pertinent variables related to the drawing task with specific implications for applied clinical use. Consequently, caution is emphasized when generalizing the results to clinical applications. Replications of the study focusing on more specific aspects of the drawing process and product are needed before a reliable clinical understanding of affective recognition can occur. Within the context of these precautions, a number of summary statements may be made.

First, adult raters possess the abilities to identify affective expressions in children's drawings at frequencies well-above chance expectations. Moreover, there are clearly significant differences in the frequency with which children can draw and adults subsequently recognize various affective expressions. Happiness and Sadness were recognized much more frequently than were Fear, Surprise, Disgust, and Anger. Second, higher adult recognition rates coincided with increases in child age. Third, the sex of the child artist affected recognition rates in very specific ways. Significant child sex differences were obtained

for most of the affective expressions. Significant Child Age X Child Sex interactions were also obtained for each affective expression and confidence rating; although there was no consistent trend in the distribution of these data. Fourth, Rater Sex clearly did not affect the adult recognition rates for all combinations of the variables. Neither the female nor male adults showed significantly superior identification skills. Fifth, there were differences between rater groups in their abilities to accurately identify affective expressions, with higher recognition rates for the Psychology Graduate Students and the lower recognition rates for the Non-Mental Health raters. However, individual differences within groups rather than differences between groups appears to have been the critical differentiating factor with this adult sample. There were consistent differences between groups on confidence ratings for five of the six affective expressions, with an inverse relationship occurring between rater accuracy and rater confidence such that more accurate recognition rates were associated with lower rater confidence scores, and vice versa. Sixth, raters were apparently cognizant of their limitations when identifying affective expressions as indicated by significantly higher confidence ratings obtained for correctly identified drawings as contrasted with the lower ratings for incorrectly identified drawings. Finally, a few additional significant interactions were obtained which pro-

vided no clear information regarding the drawing data as a whole. Each of these observations will now be considered in greater detail.

Affective Expression:

The most basic question posed in this study was, "Can adults correctly identify children's affective expressions when depicted in human figure drawings?". As the data indicated, the adult raters clearly demonstrated an ability to identify affective expressions at a rate well-above chance expectation. Moreover, except for a few individual exceptions which contributed to group differences, there was generally little variability between raters in their expertise on the task, as indicated by the relatively small standard deviation. The high degree of inter-rater consistency is remarkable when considering the complexity of the task requirements, suggesting that most adults may be expected to perform at a level of proficiency comparable to that of the raters in this sample.

The overall rate of accuracy was much lower for this task than for other drawing recognition tasks. For example, Hiler and Nesvig (1965) and Striker (1967) reported group accuracy rates ranging from 64%-79%. Lower accuracy rates were reported by Rogers and Wright (1971) and large between subjects variability was reported by Levenberg (1975). In the present study, the highest individual recognition rate was only 66.7%. The disparity might be best

attributed to the differential task requirements of the various studies. Raters in prior studies were required to make dichotomous selections between drawings, i.e., "disturbed" versus "non-disturbed". The present study introduced six affective expressions in a forced-choice format, consequently increasing the likelihood for rater error. When considering the greater potential for rater error in the current study, the obtained results suggest that adults are highly capable of accurately and consistently identifying children's graphic representations of affective expressions. However, from a clinical perspective, the accuracy rate is very low, particularly when considering the adjusted accuracy rates. Therefore, it may be concluded that adult raters display a remarkable ability to identify children's graphically represented affective expressions, but the frequency of judgement errors may be too high for practical clinical use.

The differential depiction and recognition of specific affective expressions was generally consistent with previous research findings (e.g., Gates, 1923; Strattner, 1963; Carothers & Gardner, 1979; Ives, 1980). That is, some affective expressions are apparently easier for the child to draw (or comprehend) in a manner consistently recognized by adults. Although recognition rates for all affective expressions exceded chance expectations, some affective expressions were recognized significantly more frequently

than others. The tri-modal distribution indicated the recognition rate for Happiness and Sadness exceeded 80% (60%, adjusted), was approximately 50% (36%, adjusted) for Anger and Disgust, and was approximately 37% (25%, adjusted) for Surprise and Fear. Thus, Happiness and Sadness were recognized with a high level of accuracy; Anger and Disgust were correctly and incorrectly identified at approximately equivalent rates; and, Surprise and Fear were more frequently misidentified than they were correctly identified. These results are consistent with previous observations indicating higher recognition rates for the more extreme and distinctive, or "primary", emotional expressions (Gates, 1923, 1925; Strattner, 1963; Ives, 1980). For example, Camras et al. reported a similar pattern of affective recognition for 3-6 year old children with and without histories of familial abuse. Happiness, Sadness, and Anger were recognized significantly more frequently than Fear, Surprise, and Disgust. Replications of these observations with clinical and non-clinical child populations might suggest that Happiness, Sadness, and Anger can be utilized for assessment purposes.

The results of this study clearly demonstrated the need to incorporate the effects of commission errors into the overall affective recognition rates. The differences between identification rates for non-adjusted scores and scores adjusted to include commission errors have important

clinical implications. For example, if the non-adjusted recognition rates are considered at face value, it would appear that adult raters are highly competent in recognizing Happy and Sad expressions in children's drawings. However, the accuracy rates dropped significantly when commission errors were incorporated into the data. Whereas the unadjusted data suggest that the adult accuracy rates for Happiness and Sadness range from 80%-90%, the rate drops to 60% for the adjusted data. Thus, these adult raters (and probably others) were unable to reliably utilize the drawing data even as a gross measures of affective identification.

It is clinically interesting to consider the types and and frequency of commission errors as they affected recognition of specific affective expressions. For example, Fear was the least frequently recognized affective expression, but it was also the most frequently misattributed affective expression. Therefore, clinicians might be expected to frequently misattribute Fear in their interpretations of children's drawings, a misattribution with potentially negative consequences for child assessment. Incorporating the effects of commission errors for Happiness also presents clinical concerns. Although Happiness was the most frequently correctly identified affective expression, it was also a frequently misattributed affective expression suggesting that the adult raters tended to look

for positive affects in many drawings. Judgement errors of the latter type might suggest a tendency toward cautious attribution of negative affective expressions to children's drawings, which also has negative implications for reliable clinical assessment. Thus, when comparing recognition rates for Happiness and Fear, there appears to be a trade-off between false-positive and false-negative judgement errors.

Sadness was the most reliably recognized of the affective expressions. The accuracy rate was 84% (63%, adjusted) despite the fact that only approximately 13% of the drawings were identified as Sadness (16.7% was expected). That is, although Sadness was the least frequently attributed affect, the rate of correct identification of Sadness was very high. Moreover, a relatively few drawings were misattributed to Sadness. Thus, the adult judges displayed a combination of relatively superior skills when identifying Sadness in drawings and a tendency not to misattribute Sadness to other affective expressions. Clinically, these results suggest that if the child chooses to represent Sadness in a drawing, there is a good likelihood that it will be accurately identified; and, conversely, if the child chooses not to present Sadness in drawings, there is also a relatively low probability that the adult rater will make false judgements. Therefore, the recognition of Sadness in children's drawings has promising implications for clinical

assessments.

While Sadness was the most consistently correctly recognized affective expression, Fear was the most consistently incorrectly identified expression. Adult recognition of Fear was unique in that 167% more attributional errors were made than were correct attributions. Thus, there was a much greater likelihood of incorrectly identifying Fear than there was of correctly identifying Fear. Similar results were also obtained for Surprise, although to a lesser extent. That is, more attributional errors than correct attributions were made for Surprise. Many of these errors occurred as a result of difficulties differentiating Fear from Surprise, suggesting that Fear and Surprise represent close affective blends. These results are consistent with previous observations regarding affective blends (e.g. Camras et al., 1984), and suggest that adults will tend to misidentify Surprise and Fear at frequency rates well-above acceptable assessment standards. Moreover, the confidence ratings data suggests that the adult judges may not recognize the likelihood of judgement errors with Fear and Surprise. Although mean confidence ratings were low relative to some of the affective expressions, the confidence ratings for correct and incorrect identifications of Fear and Surprise were essentially equivalent. Therefore, caution is encouraged when attempting to infer either Surprise or Fear from children's drawings.

In the context of the relatively low adult recognition rates, the confidence ratings data suggest that the raters more efficiently identified affective expressions than the recognition data would suggest at face value. Apparently, the raters were frequently aware of their limitations when attempting to identify children's affective expressions in drawings, and with few exceptions, the adults reported significantly higher confidence ratings for the drawings correctly identified and lower ratings for the drawings incorrectly identified. Moreover, the adults reported higher confidence ratings for those specific affective expressions most frequently correctly identified, such as Happiness and Sadness. For example, the highest mean confidence ratings obtained for correctly identified drawings and the lowest mean confidence ratings for incorrectly identified drawings were both for Happiness and Sadness, suggesting that the higher recognition rates represented accurate indications of rater abilities. Similar results were obtained for Anger and Disgust in which the mean differences between rater's correctly and incorrectly identified drawings represented clinically significant differences.

The difficulty raters experienced in differentiating Fear from Surprise was confirmed by the results from the confidence ratings. There were essentially no differences between the confidence ratings obtained for correctly and incorrectly identified drawings for these two affective

expressions. Therefore, in addition to their limited abilities to correctly identify these affective expressions, the raters tended to be unaware of the likelihood of judgement errors.

Child Age:

The data clearly indicated that improved identification of affective expressions coincided with increases in the children's ages. Approximately 44% of the kindergarten drawings (27.9%, adjusted) were correctly identified as compared with approximately 65% for the tenth-grade students (47.8%, adjusted). The increase tended to be progressive across ages with the exception of higher accuracy rates for eighth-grade than tenth-grade children. Moreover, a developmental trend characterized the progression with increased increased accuracy rates occurring at specific age levels. The children could be categorized into three groups, i.e., kindergarten, second-sixth grades, and eighth and tenth grades. The recognition rates among the kindergarten children tended to be much lower than for all other ages (approximately 43%), followed by a notable increase and relative plateau during the second-sixth grades (56%). Another significant increase in recognition rates occurred during the eighth and tenth grades (65%).

The age progressions were considerably less consistent for the specific affective expressions than when the drawings were collapsed across all affective conditions. For

example, an age progression in the recognition rates was not apparent for Happiness. In fact, there was a decline from 94.9% for the kindergarten children to 82.9% for the tenth grade children. However, when these scores were adjusted to include commission errors, the recognition rates dropped significantly for the kindergarten children while remaining relatively more stable for the older children. Thus, the frequency of Happiness attributional errors was much higher among the younger children than the older children.

Although the data clearly demonstrated increasing adult identification rates as a function of increases in child age, it is important to note that the highest accuracy rate was only 67.2% for any age group (50.6%, adjusted). Thus, even for the older children the adult raters displayed at best a two-thirds accuracy rate when identifying the affective expressions. Moreover, it could not be determined from the data whether the recognition rate would continue to increase in older adolescence and adulthood, particularly since the oldest age group attained lower recognition rates than the next younger group. In the context of observations made by Gates (1923, 1925) and Ives (1980), among others, it seems unlikely to expect further significant increases in recognition rates if older adolescents and adults are added to the sample. It seems clear, however, that some affective expressions will be frequently misidentified across all ages, particularly when the adjusted scores are considered.

For example, although Happiness and Sadness may be expected to be frequently recognized, Surprise and Fear will be infrequently recognized.

The results provide data from which to establish floor recognition rates for the various affective expressions, but not to establish ceiling recognition rates. The older children were unable to consistently produce identifiable affective expressions. For example, although the adult raters correctly identified Happiness and Sadness in over 80% of the drawings made by 15-16 year old children, recognition rates for the remaining affective expressions were lower than 66%. The adjusted rates dropped these figures below 50%. Thus, it appears that certain affective expressions are difficult for children to depict in drawings. The considerable variability in the recognition rates for the affective expressions also suggests that the acquisition of skills needed by the children to successfully represent affect in drawings follows a developmental course. Fewer of the younger children's drawings as contrasted with the older children's drawings were correctly identified, indicating improved rater differentiation as a function of increasing child age.

Child Sex:

Three general observations may be made from the Child Sex data. First, significant Child Sex X Child Age interactions were obtained for each affective condition for the

ANOVA confidence and accuracy data. However, the interactions were inconsistent across affective conditions, and consequently, not easily interpretable. Moreover, when the data from the six affective conditions were collapsed by age level, the difference in the recognition rates were minimal, suggesting that either the younger children less accurately portrayed affect or the adults less frequently correctly identified the younger children's drawings. Second, Child Sex differences occurred for specific affective expressions, and did so in a manner consistent with a socio-cultural explanation of the differences. Third, Child Sex did not significantly interact with Rater Sex, Rater Group, and other variables in a consistent fashion.

The previous literature suggests that girls, and particularly girls at younger ages, perform better than same-aged boys on drawing tasks such as was required in the present study (e.g., Bieliauskas, 1960; Fraterson & Witkin, 1970; Willsdon, 1977). Girls, as a group, develop the fine motor skills necessary for drawing tasks at earlier ages than boys, and maintain a relative superiority of drawing skills throughout much of childhood. The current results are incongruent with these observations. The means from the ANOVAs varied considerably between affective expressions in terms of the relative superiority of affective recognition at each age level. For example, the largest Child Sex difference for Happiness drawings occurred for the tenth-grade

students and not for the young children. Higher recognition rates for girls among the younger children occurred only for Sadness. As a rule, no consistent Child Sex X Child Age pattern emerged from the data. In the spirit of cautious interpretation of the data, the differences would best be conservatively analyzed, particularly since only six children are represented in each Child Age X Child Sex cell.

The task requirements of this and previous studies varied significantly, which probably contributed to the differences in the results. Whereas prior studies have been concerned with the quality and articulation of the drawing product, the present study did not assess issues of drawing quality. The task demanded greater subjectivity from the raters, such that any and all aspects of the drawing product were included in the identification process. No assistance was given or restrictions placed upon the raters when making their selections. These results were probably less affected by the children's drawing skills than was the previous research. Therefore, if the younger girls are superior to boys in their graphic motor skills as indicated in the literature, the representation of affect in drawings is apparently not significantly influenced by fine motor development. One way to address the issue is to incorporate a standardized test of grapho-motor skills into the affective drawing task, thus providing comparison data. Regardless, these data clearly demonstrated that the drawings made by

female and male children were identified at a high level of consistency across age levels.

Significant differences between child sexes for the adult recognition rates occurred for specific affective expressions. Sadness and Surprise were identified more frequently in the female drawings; Anger and Fear were identified more frequently in the male drawings. There were no Child Sex differences for Happiness or Disgust.

One might speculate from the pattern of the Child Sex differences that these results reflected some of the dominant socio-cultural values and behaviors attributed to the sexes. For example, in a culture in which physical aggression is more overtly condoned and encouraged among male than female children and adolescents, the display of certain affective expressions may be differentially reinforced for the sexes and thus show up in the children's drawings. Anger and Fear, which might be considered to represent more overt and aggressive affective expressions, were more frequently identified in the drawings made by the male children, while Sadness and Happiness, which might be considered to represent less aggressive affective expressions, were more frequently identified in the drawings made by the girls. This differential recognition is an intriguing issue, since it imlpies that the sex of the child may be identified through a drawing(s), particularly if the content is affected by socio-sexual development. Presenting the same drawing sti-

imuli to adult raters and requesting them to identify the sex of the child from the drawings would provide information information regarding internal and perhaps unrecognized cues the raters use to differentiate child sex. Although speculative, this explanation has some empirical support. A number of investigators have reported significant between-culture differences on drawing tasks. For example, Dennis (1966a, 1966b) and Henderson, Butler, Goffeney, Saito, and Clarkson (1971), among others, reported differences in the percentage of the sex of the figure first drawn on DAM/DAP tests as a factor of culturally-inculcated values.

The comparison between sexes is particularly salient when recalling the difficulty the raters had in distinguishing between Surprise and Fear. Within the context of this observation, the results of the Child Sex data indicated that adult raters were more likely to attribute Surprise to female and Fear to male children. From a clinical perspective, the potential for false-positive and false-negative errors are a concern. Moreover, the expression of Fear in an assessment will tend to receive more attention than the expression of Surprise, since Surprise is a more clinically benign and "normal" expression. Therefore, the expectation that adults will tend to attribute Fear to a male drawing, while a similar expression would be construed as Surprise in a girl's drawing may suggest a greater likelihood for attributing phobic/anxiety problems to boys than to girls.

Similar comparisons may be made for the differential recognition rates of Anger and Sadness. Following from the criticisms of the diagnostic ambiguity and even the existence of childhood depression, the recent clinical literature has been characterized by attempts to empirically substantiate childhood depression as a distinct clinical condition (e.g., Gittleman-Klein, 1977; Lefkowitz & Burton, 1978). A proposed distinction between internalized (e.g., withdrawal) and externalized (e.g., overt aggression) manifestations of depression has been suggested, which is somewhat analogous to prior ideas of a "masked" depression. In the context of probable behavioral differences in the manifestation of depression, the results obtained from this study suggest that the recognition and differentiation of Sadness and Anger in human figure drawings may provide potentially important diagnostic information. The adult raters may be expected to recognize passive expressions of depression in girl's drawings, such as sadness, and active expressions of depression in boys' drawings, such as anger. Thus, Child Sex should be carefully considered when using children's drawings to infer affective functioning.

These explanations for the differences in recognition rates for Sadness and Anger, and Surprise and Fear are speculative and derived from a limited data base. Nevertheless, they account for the between sex differences and provide a reasonable direction for further research. The data clearly

demonstrated the complexity of the drawing task, and the need for consideration of the child's sex and socio-cultural influences when cautiously interpreting the data.

Finally, there were no significant differences in the results for the interactional effects of Child Sex with Rater Sex, Rater Group, or other combinations of the variables. The significant interaction effects involving other variables did not yield an interpretable pattern.

Rater Sex:

Sex of the adult rater did not significantly affect adult recognition or confidence rates, suggesting that female and male raters will display similar capabilities in identifying (and misidentifying) the children's representations of affective expressions in their drawings. The absence of significant differences between sexes in the comparisons of the specific affective expressions, child age levels, rater groups, and child sex was striking in its consistency and clearly indicates that Rater Sex minimally affected rater accuracy and rater confidence data.

There was no clear precedent established in the literature from which to make predictions regarding expected sex differences on an affective recognition task. Nevertheless, the consistent absence of significant differences is remarkable when considering the large number of comparisons made and the subsequent likelihood for some artifactual differences. Therefore, it may be concluded with a

high degree of certainty that the Rater Sex variable will minimally and probably not significantly affect rater performance on similar recognition tasks.

From a clinical perspective, these data clearly indicate that female and male adults, as groups, may be expected to display equivalent abilities on assessment tasks requiring similar skills. From an experimental perspective, these data suggest that future investigators need to minimally attend to Rater Sex variables.

Rater Group:

Significant differences were obtained between Rater Groups for affective recognition rates, with the Graduate Students attaining the highest accuracy results followed by the Child Psychologists and the Non-Mental Health raters. These results further contribute to the inconsistencies in the literature regarding rater group differences. For example, while some studies have reported relatively superior performance by psychology graduate students and clinical trainees (e.g., Hiler & Nesvig, 1965; Striker, 1967), others have reported no significant differences between clinically experienced and inexperienced raters (e.g., Schaeffer, 1964; Levenberg, 1975). The one consistent observation made in the previous studies and reaffirmed in the present study is that experienced child psychologists do not display superior abilities on drawing identification tasks. However, the issue of relative superiority is less

clearly evident for the clinical trainees.

The issue is further complicated in the present sample when the specific individual response rates are considered. The lower mean scores obtained for the Non-Mental Health group may have been an artifact of idiosyncratic characteristics of subjects within groups, rather than due to actual group differences. Specifically, the affective recognition rate for a female rater from the Non-Mental Health group was significantly lower than for all other adults. Her 38.0% recognition rate compared with the mean average of 57.7% for all adults.

Although significant differences between rater groups were obtained from a few of the rater accuracy and most of the rater confidence ANOVAS, no other significant Rater Group interactions were obtained indicating that the group effects were very specific. The Graduate Students produced more correct responses than the Child Psychologists and the Non-Mental Health raters, but an inspection of the group means revealed no clear dichotomous split between groups. For example, the percentage difference between the Graduate Students and the Child Psychologists when comparing total group response rates was very similar to the percentage difference between the Child Psychologists and the Non-Mental Health raters (i.e., 2.9%, or 78 drawings and 2.7%, or 68 drawings, respectively). Similarly, the absolute difference in performance accuracy between the Graduate Stu-

dents and the Child Psychologists for the identification of Disgust (one of two significant Rater Group differences from the rater accuracy data) was essentially equivalent to to the difference between the Child Psychologists and the Non-Mental Health raters (i.e., 33 drawings and 34 drawings, respectively). Thus, it cannot be determined from these results whether the obtained between group differences are best attributed to superior performance by the Graduate Students or inferior performance by the Non-Mental group. Moreover, the statistically significant differences should be weighed against the clinical significance of the differences, which in the present study was minimal. In the context of these considerations, it seems that the background and training of the raters in this study, and probably with previous studies, minimally affected accuracy rates.

The comparisons of the rater accuracy data with the rater confidence data provided clinically interesting results. With few exceptions, the highest accuracy rates coincided with the lowest rater confidence levels, and vice versa. Thus, a clear pattern emerged in which the more skillful raters underestimated their judgement abilities, while the less skillful raters overestimated their abilities. It might be concluded that more conservative raters will achieve higher accuracy rates on drawing identification tasks. However, the higher confidence ratings ob-

tained from the Non-Mental Health raters may not indicate perceived skill per se, but may reflect differential exposure to this type of judgement task. The relatively lower ratings obtained from the Child Psychologists and the Graduate Students may be attributed to their clinical training and specific knowledge regarding the complexities of drawing recognition tasks. The Non-Mental Health raters do not share the same training histories, and therefore, probably approached the task with greater clinical "naivete". The performance comparison between the Child Psychologists and the Graduate Students is more meaningful, since they share similar training histories and, therefore, would be expected to perform comparably. The relatively superior performance by the clinically less experienced Graduate students offers some justification for a conservative approach to this task.

In summary, the obtained between group differences should be cautiously interpreted when applied to clinical practice. Minimal differences in performance abilities differentiated rater groups, particularly in the comparisons of Child Psychologists with the Graduate Students. The inconsistency of the differences suggests that future investigations should emphasize individual rather than between group differences. Whereas an objective of the between group comparisons was to assess the effects of clinical experience on performance accuracy, the inconsistencies

in the reported data suggest that an understanding of individual rather than group differences will more effectively differentiate performance-related skills. Specifically, an analysis of the raters' strategies used for correctly and incorrectly identifying drawings would provide important clinical information. The focus on individual response strategies is further supported by the confidence ratings data which suggested that raters are often aware of the accuracy and inaccuracy of their decisions. Thus, the raters apparently are cognizant of some of the cues in the drawings which effectively differentiate specific affective expressions.

Summary and Conclusions

The present study attempted to determine the abilities of adult raters to correctly identify a number of common affective expressions represented by children in their drawings. Human figure drawings displaying Happiness, Sadness, Anger, Fear, Surprise, and Disgust obtained from 72 kindergarten through tenth grade students were presented to a total of 36 female and male child psychologists, psychology graduate students, and adults in non-mental health occupations. A number of variables potentially affecting differential adult identification rates were systematically assessed. The following summarizes the results and conclusions:

Affective Expressions:

1. The adults were able to correctly identify the intended affective expressions at significantly higher rates than expected by chance. Some affective expressions, such as Happiness and Sadness, were frequently recognized while others, such as Fear and Surprise, were more frequently misidentified than correctly identified.

2. From a clinical perspective, the recognition rates for Happiness and Sadness were sufficiently high to be of potential value in the traditional child assessment. However, the frequency of judgement errors, particularly when commission errors were considered was to high to allow for adequate psychometric reliability for any of the affective

expressions.

Child Age:

1. Increases in adult recognition rates clearly coincided with increases in the age of the children. Moreover, a progressive developmental pattern was apparent such that the kindergarten, second-sixth, and eighth-tenth grade children displayed plateaus of progress.

2. No stable recognition levels were obtained for the affective expressions. That is, it was not determined from these data the ages of the children/adolescents at which adult raters would reach their maximum level of identification accuracy. In this sample, the most proficient adult identification rate was approximately 67% for an age group.

Child Sex:

1. The adult recognition rates for the combined affective expressions were essentially equivalent for female and male children when controlling for child age level. These results were not consistent with the vast majority of the literature which has shown relatively superior skills by girls on drawing tasks. Thus, affective identification tasks may not be significantly influenced by drawings skills per se, but represent greater complexity.

2. Significantly higher adult recognition rates for Sadness and Surprise were obtained from girls' drawings while higher recognition rates were obtained for Anger and Fear from boys' drawings. It was suggested that culturally

inculcated values contributed to these differences and therefore, could lead to specific clinical judgement errors with children. For example, the assessment of childhood depression through drawings may be subtlely biased such that there is a tendency to infer passive manifestations of depression in girls' drawings and active manifestations of depression in boys' drawings.

Rater Sex:

1. The sex of the adult rater did not significantly affect recognition accuracy. Apparently, female and male adults possess equivalent capabilities to correctly and incorrectly identify children's graphically presented affective expressions.

Rater Group:

1. Significant between group differences in the recognition rates were obtained with Graduate Students displaying highest and Non-Mental Health raters the lowest performance; the Child Psychologists' performance closely approximated the overall mean accuracy rate. The significant differences between groups were attributed to individual rather than actual group differences. It was concluded that the amount of differences between groups was not clinically significant.

2. The obtained results were consistent with previous data in showing no relative superiority in recognition rates by the experienced clinicians over less clinically

experienced judges. Thus, experience in drawing assessment does not necessarily produce better affective identification skills.

Throughout this discussion, cautious interpretations of the data have been recommended, and in summarizing the clinical significance of these results, the need for caution will be reemphasized. The data clearly indicated that the identification of affect in children's drawings is a complex task requiring recognition and awareness of the interaction of a number of factors. The current study effectively identified the contribution of the child's sex, the child's age, the adult rater's sex, and the rater's prior clinical experience with drawings to the adult recognition rates. However, this was a seminal and descriptive study, and therefore, the objectives were general rather than focused on specific comparisons. The results, for the most part, do not unequivocably answer the empirical questions, but suggest the direction for further investigation.

These results reaffirmed the unreliability of traditional drawing techniques, but also identified some reasons for their poor track record. There were also suggestions that fine-tuning some aspects and goals of the procedure could lead to sufficiently reliable and valid applications of drawings for affective assessments of children, under clearly defined constraints.

The experimental model employed may be an effective

model for further research. The selection of a wide age range of children from a non-clinical population, the inclusion of a relatively large number of drawings made by each child, an atheoretical experimental approach to the investigation, and a focus on a discrete aspect of personality functioning (i.e., affective expression) were among the attributes of the design.

It is recommended that further research focus on the specific aspects of the total process involved in the depiction and recognition of affect in children's drawings. This study, because of its applied clinical emphasis, primarily addressed the understanding of children's representation of affective expressions from the rater's perspective, and indirectly investigated child differences as revealed through adult recognition rates. More clearly focused investigations are needed to directly address the child variables affecting the drawing products.

Important clinical assessment concerns were raised. For example, the differential adult recognition of Surprise and Fear in the drawings made by girls and boys has potentially significant clinical implications. The absence of consistent patterns in the direction of Child Sex X Child Age effects suggests the need for Child Sex comparisons on measures of graphic articulation and drawing skills as a means to determine the relative effect of motor skills on test results.

A relevant extension of the present experimental task is to obtain data from the children regarding their abilities to identify various affective expressions, along the lines of the recognition of photographically depicted affective expressions used by Gates (1925) and Camras et al. (1983). These data would address the issue of differential acquisition of recognition and performance skills in the child's understanding of affect. From a clinical perspective, it seems critical to objectively assess the child's cognition of affect before making subjective assumptions regarding affective functioning from a drawing. This issue seems particularly cogent in the context of the literature on children's expression of movement in drawings. Recall that most children have considerable difficulty depicting reliably identifiable movement in their Kinetic Family Drawings before the age of 9 years, but that the development and use of the KFD did not account for these data. Speculating from the results of the current study, similar types of assessment errors could occur. For example, an adult rater might incorrectly infer affective functioning from a drawing without considering the child's developmental limitations in recognizing and subsequently drawing the affect.

Finally, evidence from previous research and reaffirmed in the current study indicates that clinical experience alone does not contribute to higher accuracy rates on

drawing identification tasks. The data showed a wide range of recognition rates between individuals suggesting the need to empirically assess the strategies used by the raters to determine the critical variables differentiating affective expressions. Thus, further research should focus on individual response styles.

In summary, the results obtained from this study clarified many ideas regarding adult recognition of affect and the abilities of children to represent affect in human figure drawings. Although the rating process is a complicated and subjective phenomenon, it appears that subjectivity of judgement can be reduced as the contributions of the significant variables are more closely scrutinized and consequently, understood. These results provide encouragement for the development of a reliable but limited application of affective recognition and representation in the child assessment. However, the manifestation of the procedure will differ considerably from the traditional techniques.

References

Adler, L.L. & Berkowitz, P.H. (1976). Influencing associative thinking and imagery in emotionally disturbed children. Psychological Reports, 39, 183-188.

Amchin, A. & Abrams, A. (1976). Draw-a-Person in the Rain projective technique. In O. Johnson (Ed.), Tests and measurement in child development: Handbook II, Vol. 1 (pp. 658-659). San Francisco: Jossey-Bass.

Anastasi, A. & Foley, Jr., J.P. (1940). A survey of the literature on artistic behaviors in the abnormal: III. Spontaneous productions. Psychological Monographs, 52, No. 237, 1-71.

Apfeldorf, M., Walter, C.L., Kaimen, B.D., Smith, W.J., & Arnett, W.A. (1974). A method for the evaluation of affective association to figure drawings. Journal of Personality Assessment, 38, 441-449.

Barnhart, E.N. (1942). Developmental stages in compositional construction in children's drawings. Journal of Experimental Education, 11, 156-184.

Bassett, E. (1975). Production strategies in the drawing of the human figure: Towards an argument for a model of syncretic perception. In G. Butterworth (Ed.), The child's representation of the world (pp. 49-59). New York: Plenum.

Bieliauskas, V.J. (1960). Sexual identification in children's drawings of human figures. Journal of Clinical

Psychology, 16, 42-44.

Bolander, K. (1977). Assessing personality through tree drawings. New York: Basic Books.

Brannigan, G., Margolis, H., & Moran, P. (1979). Cognitive tempo and children's human figure drawings. Perceptual and Motor Skills, 49, 414.

Britain, S.D. (1970). Effect of manipulation of children's affect on their family drawings. Journal of Projective Techniques and Personality Assessment, 34, 234-237.

Brittain, W.L. (1969). Some exploratory studies of the art of pre-school children. Studies in Art Education, 10, 14-24.

Brown, W.R. & McGuire, J.M. (1976). Current psychological assessment practices. Professional Psychology, 7, 475-484.

Buck, J. (1948). The House-Tree-Person technique: A qualitative and quantitative scoring method. Journal of Clinical Psychology: Monograph, 5, 1-120.

Burns, R.C. (1982). Self-growth in families: Kinetic family drawings - Research and application. New York: Brunner/Mazel.

Burns, R.C. & Kaufman, S.H. (1970). Kinetic family drawing: An introduction to understanding children through kinetic drawings. New York: Brunner/Mazel.

Burns, R.C. & Kaufman, S.H. (1972). Actions, styles, and symbols in kinetic family drawings (KFD): An interpre-

manual. New York: Brunner/Mazel.

Burns, C. & Velicer, W. (1977). Art instruction and the Goodenough-Harris Drawing Test in fifth graders. Psychology in the Schools, 14, 109-112.

Calhoun, G., Whitley, J.D., & Ansolabehere, E.M. (1978). An investigation of the Goodenough-Harris Drawing Test and the Coopersmith Self-Esteem Inventory. Educational and Psychological Measurements, 38, 1229-1232.

Camras, L.A., Grow, J.G., & Ribordy, S.C. (1983). Recognition of emotional expression in abused children. Journal of Clinical Child Psychology, 12, 325-328.

Carothers, T. & Gardner, H. (1979). When children's drawings become works of art: The emergence of aesthetic production and perception. Developmental Psychology, 15, 570-580.

Celotta, B.K. (1973). Knowledge of the human figure as measured by two tasks. Developmental Psychology, 8, 377-371.

Coopersmith, D.S., Sakai, D., Beardslee, B., & Coopersmith, A. (1976). Figure drawings as an expression of self-esteem. Journal of Personality Assessment, 40, 370-375.

Coyle, F.A. & Eisenmann, R. (1970). Santa Claus drawings by Negro and white children. Journal of Social Psychology, 80, 201-205.

Craddick, R.A. (1962). Size of Easter egg drawings before and after Easter. Perceptual and Motor Skills, 15, 591-

593.

Craddick, R.A. (1963a). Size of Halloween witch drawings prior to, on, and after Halloween. Perceptual and Motor Skills, 16, 235-238.

Craddick, R.A. (1963b). Height of Christmas tree drawings as a function of time. Perceptual and Motor Skills, 17, 335-337.

Dalby, J.T. & Vale, H.L. (1977). Self-esteem and children's human figure drawings. Perceptual and Motor Skills, 44, 1279-1282.

Dashiell, J.F. (1927). A new method of measuring reaction to facial expressions of emotion. Psychological Bulletin, 24, 174-175.

Davidson, H.H. & Greenberg, J.W. (1976). Drawing completion task. In O. Johnson (Ed.), Tests and measurement in child development: Handbook II, Vol. 1 (pp. 334-335). San Francisco: Jossey-Bass.

Davis, C.J. & Hoopes, J.L. (1975). Comparison of HTP drawings of young deaf and hearing children. Journal of Personality Assessment, 39, 28-33.

Dennis, W. (1966a). Goodenough scores, art experience, and modernization. Journal of Social Psychology, 68, 211-227.

Dennis, W. (1966b). Group values through drawings. New York: Wiley.

Denson, T.A. & May, D.C. (1978). The reliability of chil-

dren's drawings as indications of brain damage. Educational Research Quarterly, 3, 45-48.

DiLeo, J.H. (1970). Young children and their drawings. New York: Brunner/Mazel.

DiLeo, J.H. (1977). Child development: Analysis and synthesis. New York: Brunner/Mazel.

Dreyer, A.S. & Rigler, D. (1969). Cognitive performance in Montessori and nursery school children. Journal of Educational Research, 62, 411-416.

Ekman, P. (1973). Darwin and facial expression. New York: Academic Press.

Ekman, P. & Friesen, W.V. (1971). Constants across cultures in the face and emotion. Journal of Personality and Social Psychology, 17, 124-129.

Ekman, P. & Friesen, W.V. (1975). Unmasking the face. Englewood Cliffs, NJ: Prentice-Hall.

Ekman, P. & Friesen, W.V. (1978). The facial action coding system. Palo Alto, California: Consulting Psychology Press.

Ekman, P., Sorenson, E.R., & Friesen, W.V. (1969). Pan-cultural elements in facial displays of emotions. Science, 164, 86-88.

Entin, A. (1976). Draw-a-person test as a measure of ego-stage development. In O. Johnson (Ed.), Tests and measurement in child development: Handbook II, Vol. 1 (pp. 421-423). San Francisco: Jossey-Bass.

Ferin, N.J. (1976). Draw-a-Group Test. In O. Johnson (Ed.), Tests and measurement in child development: Handbook II, Vol. 1 (pp. 484-485). San Francisco: Jossey-Bass.

Franck, K. & Rosen, E.A. (1949). A projective test of masculinity-femininity. Journal of Consulting Psychology, 13, 247-256.

Fraterson, H.F. & Witkin, H.A. (1970). A longitudinal study of the body concept. Developmental Psychology, 2, 429-438.

Freeman, N.H. (1976). Children's drawings: Cognitive aspects. Journal of Child Psychology and Psychiatry, 17, 345-350.

Freeman, N.H. (1977). How young children try to plan drawings. In G. Butterworth (Ed.), The child's representation of the world. New York: Plenum.

Freeman, N.H. (1980). Strategies of representation in young children: Analysis of spatial skills and drawing processes. London: Academic Press.

Friedman, S.L. & Stevenson, M.B. (1975). Developmental changes in the understanding of implied motion in two-dimensional pictures. Child Development, 46, 773-778.

Fuller, G.R., Preuss, M., & Hawkins, W.F. (1970). The validity of the human figure drawing with disturbed and normal children. Journal of School Psychology, 8, 54-56.

Gaitskell, C.D. & Hurwitz, A. (1975). Children and their art. New York: Harcourt, Brace, & Jovanovich.

Gardner, H. (1980). Artful scribbles: The significance of children's drawings. New York: Basic Books.

Gates, G.S. (1923). An experimental study of the growth of social perception. Journal of Educational Psychology, 14, 449-461.

Gates, G.S. (1925). A test for ability to interpret facial expression. Psychological Bulletin, 22, 120.

Gellert, E. (1968). Comparison of children's self-drawings with their drawings of other persons. Perceptual and Motor Skills, 26, 123-138.

Gittelman-Klein, R. (1977). Definitional and methodological issues concerning depressive illness. In J.G. Shulterbrandt & A. Raskin (Eds.), Depression in Children: Diagnosis, Treatment, and Conceptual Models. New York: Raven Press.

Golumb, C. (1973). Children's representation of the human figure: The effects of models, media, and instruction. Genetic Psychology Monographs, 87, 197-251.

Golumb, C. (1974). Young children's sculpture and drawing. Cambridge, Massachusetts: Harvard University Press.

Golumb, C. (1977). Representational development of the human figure: A look at the neglected variables of SES, IQ, sex, and verbalization. Journal of Genetic Psychology, 131, 207-222.

Goodenough, F.L. (1926). Measurement of intelligence by drawings. Chicago: World Book Co.

Goodenough, F.L. & Harris, D.B. (1950). Studies in the psychology of children's drawings, II: 1928-1949. Psychological Bulletin, 47, 369-433.

Goodnow, J.J. (1977) Children's drawings. Cambridge, Massachusetts: Harvard University Press.

Goodnow, J.J. (1978) Visible thinking: Cognitive aspects of change in drawings. Child Development, 49, 637-641.

Goodnow, J.J. & Friedman, S. (1972). Orientation in children's human figure drawings: An aspect of graphic language. Developmental Psychology, 7, 10-16.

Hammer, E.F. (1958). The clinical application of projective drawings. Springfield, Illinois: Charles C. Thomas, Publishers.

Hammer, E.F. (1981). Projective drawings. In A.I. Rabin (Ed.), Assessment with projective techniques: A concise introduction (pp. 151-186). New York: Springer.

Hammer, M. & Kaplan, A.M. (1964a). The reliability of size of children's drawings. Journal of Clinical Psychology, 20, 121.

Hammer, M. & Kaplan, A.M. (1964b). The reliability of sex of first figure drawn by children. Journal of Clinical Psychology, 20, 251-252.

Handler, L. (1971). Predicting aggression and withdrawal in children with the DAP and Bender-Gestalt. Journal of

Personality Assessment, 35, 331-335.

Harris, D. (1963). Children's drawings as measures of intellectual maturity. New York: Harcourt, Bruce, World.

Henderson, N.B., Butler, B.V., Goffeney, B., Saito, C.N., & Clarkson, O.D. (1971). Sex of a person drawn by seven year olds. Journal of Personality Assessment, 35, 261-264.

Hiler, E.W. & Nesvig, D. (1965). An evaluation of criteria used by clinicians to infer pathology from figure drawdrawings. Journal of Consulting Psychology, 29, 520-529.

Hulse, W.C. (1951). The emotionally disturbed child draws his family. Quarterly Journal of Child Behavior, 3, 152-174.

Ives, W. (1980). The role of standard orientations in children's drawings of interpersonal relationships: Aspects of graphic feature making. Child Development, 51, 591-593.

Ives, W. & Rovet, J. (1979). The role of graphic orientation in children's drawings of familiar and novel objects at rest and in motion. Merrill-Palmer Quarterly, 25, 281-292.

Izard, C.E. (1971). The face of emotion. New York: Meredith Corporation.

Izard, C.E. Human emotions. (1977). New York: Plenum.

Johnson, F.A. & Greenberg, R.P. (1978). Quality of drawing

as a factor in the interpretation of figure drawings. Journal of Personality Assessment, 42, 489-495.

Karp, E., Morganstern, M., & Michal-Smith, H. (1978). Diagnosing mental deficiency. In B.B. Wolman (Ed.), Clinical diagnosis of mental disorders (pp. 709-756). New YorK: Plenum.

Kazdin, A.E. & Petti, T.A. (1982). Self-report and interview measures of childhood and adolescent depression. Journal of Child Psychology and Psychiatry, 23, 437-457.

Kellogg, R. (1969). Analyzing children's art. Palo Alto, California: National Press Books.

Kellogg, R. (1979). Children's drawings/children's minds. New York: Avon.

Kinget, G.M. (1952). The drawing completion test: A projective technique for the investigation of personality. New York: Grune & Stratton.

Klepsch, M. & Logie, L. (1982). Children draw and tell: An introduction to the projective uses of children's human figure drawings. New York: Brunner/Mazel.

Koch, C. (1952). The tree test: The tree-drawing test as an aid in psychodiagnosis. New York: Grune & Stratton.

Koppitz, E.M. (1969). Psychological evaluation of children's human figure drawings. New York: Grune & Stratton.

Laosa, L., Swartz, J., & Holtzman, W. (1973). Human figure drawings by normal children: A longitudinal study of

cognitive and personal development. Developmental Psychology, 8, 350-356.

Lefkowitz, M.M. (1964). Aggression and size of human figure drawings. Psychology in the Schools, 1, 312-314.

Lefkowitz, M.M. & Burton, N. (1978). Childhood depression: A critique of the concept. Psychological Bulletin, 85, 716-726.

Leon, G.R., Kendall, P.C., & Garber, J. (1980). Depression in children: Parent, teacher, and child perspectives. Journal of Abnormal Child Psychology, 8, 221-235.

Levenberg, S.B. (1975). Professional training, psychodiagnostic skill, and the kinetic family drawing. Journal of Personality Assessment, 39, 389-393.

Lingren, R. (1971). An attempted replication of emotional indicators in human drawings by shy and aggressive children. Psychological Reports, 29, 35-38.

Louttit, C.H. & Browne, C.G. (1947). Psychometric instruments in psychological clinics. Journal of Consulting Psychology, 11, 49-54.

Lowenfeld, V. (1947). Creative and mental growth: A textbook on art education. New york: MacMillan.

Lowenfeld, V. (1954). Your child and his art: A guide for parents. New York: MacMillan.

Lubin, R., Wallis, R., & Paine, C. (1971). Patterns of psychological test use in the United States: 1935-1969. Professional Psychology, 2, 70-74.

Machover, K. (1949). Personality projection in the drawing of the human figure. Springfield, Illinois: Charles C. Thomas.

Machover, K. (1952). Human figure drawings of children. Journal of Projective Techniques, 17, 85-91.

Macoby, E.E. & Bee, H.L. (1965). Some speculations concerning the lag between perceiving and performing. Child Development, 36, 367-377.

McNamara, J.R. & Porterfield, C.L. (1969). Levels of information about the human figure and their characteristic relationship to human figure drawings in young disadvantaged children. Developmental Psychology, 1, 669-672.

McPhee, J.P. & Wegner, K.W. (1976). KFD drawing styles and emotionally disturbed childhood behavior. Journal of Personality Assessment, 40, 487-491.

Murstein, B.I. (Ed.). (1965). Handbook of projective techniques. New York: Basic Books.

Nathan, S. (1973). Body image of chronically obese children as reflected in figure drawings. Journal of Personality Assessment, 37, 456-463.

Nichols, R.C. & Strumpfer, D.J.W. (1962). A factor analysis of Draw-a-Person test scores. Journal of Consulting Psychology, 26, 156-161.

Odom, R.D. & Lemond, C.M. (1972). Developmental differences in the perception and production of facial ex-

ressions. Child Development, 43, 359-369.

Ogdon, D.P. (1979). Psychodiagnostics and personality assessment: A Handbook. Los Angeles: Western Psychological Services.

Prytula, R.E., Phelps, M.R., Morrison, E.F., & Davis, S.F. (1978). Figure drawing size as a reflection of self-concept or self-esteem. Journal of Clinical Psychology, 34, 207-214.

Ramsden, R.D. & Coon, R.C. (1984). Developmental research on children's drawings: A clinical perspective. Manuscript submitted for publication.

Reichenberg-Hackett, W. (1964). Influence of nursery group experience on children's drawings. Psychological Reports, 14, 433-434.

Roback, H. (1968). Human figure drawings: Their utility in the clinical psychologist's armamentarium for personality assessment. Psychological Bulletin, 70, 1-19.

Rogers, R.S. & Wright, E.N. (1971). A study of children's drawings of their classrooms. Journal of Educational Research, 64, 370-374.

Schaeffer, R.W. (1964). Clinical psychologists' ability to use the Draw-a-Person Test as an indicator of personality adjustment. Journal of Consulting Psychology, 28, 383,

Schildkrout, M.S., Shenker, I.R., & Sonnen-Glick, M.

(1972). Human figure drawings in adolescence. New York: Brunner/Mazel.

Schulman, D. (1976). Drawing Completion Test (DCT). In O. Johnson (Ed.), Tests and measurement in child development: Handbook II, Vol. 1 (pp. 335-336). San Francisco: Jossey-Bass.

Scott, L.H. (1981). Measuring intelligence with the Good-enough-Harris Drawing Test. Psychological Bulletin, 89, 483-505.

Silverstein, A.B. (1966). Anxiety and the quality of human figure drawings. American Journal of Mental Deficiency, 70, 607-608.

Stacey, J.T. & Ross, B.M. (1975). Scheme and schema in children's memory of their own drawings. Developmental Psychology, 11, 37-41.

Strattner, M.J. (1963). A developmental study of young children's perception of affect in drawings of faces and postures. Dissertation Abstracts International, 24, 3857. (University Microfilms No. 64-3635).

Striker, G. 1967). Actuarial, naive clinical, and sophisticated clinical predictors of pathology from drawings. Journal of Consulting Psychology, 31, 492-494.

Sundberg, N.D. (1961). The practice of psychological testing in clinical service in the United States. American Psychologist, 16, 79-83.

Swan, G.E. & McDonald, M.L. (1978). Behavior therapy in

practice: A national survey of behavior therapists. Behavior Therapy, 9, 799-807.

Swensen, C. (1957). Empirical evaluations of human figure drawings. Psychological Bulletin, 54, 431-466.

Swensen, C. (1968). Empirical evaluations of human figure drawings: 1957-1966. Psychological Bulletin, 70, 20-44.

Tuma, J.M. & Pratt, J.M. (1982). Clinical child psychology practice and training: A survey. Journal of Clinical Child Psychology, 11, 117-121.

Vane, J.R. & Eisen, V.W. (1962). The Goodenough Draw-a-Man Test and signs of maladjustment in kindergarten children. Journal of Clinical Psychology, 18, 276-279.

Wade, T.C. & Baker, T.B. (1977). Opinions and use of psychological tests: A survey of clinical psychologists. American Psychologist, 32, 874-882.

Wadeson, H. & Carpenter, W. (1976). Television in the hospital: Programming patients' delusions. American Journal of Orthopsychiatry, 46, 434-438.

Wanderer, Z.W. (1969). Validity of clinical judgements based on human figure drawings. Journal of Clinical Psychology, 33, 143-150.

Willsdon, J.A. (1977). A discussion of some sex differences in a study of human figure drawings by children aged four-and-a-half to seven-and-a-half years. In G. Butterworth (Ed.), The child's representation of the

World (pp. 61-70). New York: Plenum Press.

Winer, G. & Brandenbury, I. (1977). Children's imitation of story content: Effects of sex-typed behavior. Psychological Reports, 41, 1147-1154.

APPENDIX A

RATER INFORMATION FORM: CHILD PSYCHOLOGISTS

RATER INFORMATION
(Child Psychologists)

SEX: M F
AGE: _____
RACE: B W Other
Number of Siblings: _____
Birth Order: _____

List the ages of your children (if you have any): ____

Years of professional work with children/adolescents: ____

Number of years since attaining your Ph.D. ____

To what degree do you use drawing techniques in your clinical work ?

	Never		Occasionally		Always
Personality Assessment:	1	2	3	4	5
Intellectual Assessment:	1	2	3	4	5
Developmental Assessment:	1	2	3	4	5
Rapport-Building Device:	1	2	3	4	5

APPENDIX B

RATER INFORMATION FORM: GRADUATE PSYCHOLOGY STUDENTS

RATER INFORMATION
(Graduate Psychology Students)

SEX: M F
AGE: _____
RACE: B W Other
Number of Siblings: ____
Birth Order: _____

List previous experiences (including professional experiences) you have had with children and adolescents (e.g. babysitting, child care, recreational groups, church groups, therapy, etc.).

List ages of your children (if you have children).

Have you been trained in the use of drawings:

___ For personality assessment?
___ For intellectual assessment?
___ For developmental assessment?

Considering your current level of training and exposure to psychological testing, how likely are you to include draw-ing tests in your testing armamentarium with children?

Personality Assessment

1 2 3 4 5

Intellectual Assessment

1 2 3 4 5

Developmental Assessment

1 2 3 4 5

Very Unlikely — Unsure — Very Likely

APPENDIX C

INSTRUCTIONS FOR ADULT RATERS

INSTRUCTIONS FOR ADULT RATERS

A large number of children of various ages were asked to draw pictures of people displaying different affective expressions. I would like for you to look at some of these drawings and determine what affective expressions are represented. You may choose between happy, sad, surprised, disgutsed, angry, and fearful. After deciding which affective expression is best represented in each drawing, I would also like for you to rate your level of confidence in your decision.

You will review 216 different drawings. Each drawing has been given a number code in the top right corner of the sheet. These numbers corresoond to the numbers on the answer sheet provided for you. For each drawing, write in the number of the affective expression you believe is represented in the drawing. Use the following code when responding:

1 = Happy

2 = Disgusted

3 = Surprised

4 = Sad

5 = Angry

6 = Fearful/Afraid

Also, for each drawing, write in the number code representing your degree of confidence in your decision. Use the following scale to determine your level of confidence:

1	2	3	4	5
Low Confidence		Moderate Confidence		High Confidence

Example: Consider picture #1. If you believe the child who drew this picture was portraying an angry affect, you would put a 5 in Column 1 of Row 1 on your answer sheet. If you are not totally confident in your decision, but are more than moderately confident, you would put a 4 in Column 2 of Row 1 on your answer sheet.

VITA

Ralph Ramsden was born in Toledo, Ohio in 1952. He received his Bachelor of Arts degree in 1976 from Columbia Union College in Takoma Park, Maryland, and his Master of Science degree in 1979 from New Mexico Highlands University in Las Vegas, New Mexico. Mr. Ramsden is married to Lauree Ann Ramsden and has a 4 year old son, Timothy. He is currently employed as a Staff Psychologist at the Grant Center Hospital, a psychiatric hospital for adolescents and children, in Citra, Florida.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Ralph D. Ramsden

Major Field: Clinical Psychology

Title of Dissertation: Children's Affective Expression In Human Figure Drawings: Adult Recognition of Children's Depiction of Six Affective Expressions

Approved:

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

Ray R. Buss

Mary L Kelley

Date of Examination:

March 15, 1985